HP ProLiant BL20p Generation 3 Server Blade
User Guide

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About This Guide

This guide provides step-by-step instructions for installation, and reference information for operation, troubleshooting, and future upgrades for the HP ProLiant BL20p Generation 3 server blade.

Audience Assumptions

This guide is for the person who installs, administers, and troubleshoots servers. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

⚠ Important Safety Information

Before installing this product, read the *Important Safety Information* document included with the server.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:

> ⚠ **WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult the documentation for specific details.**

This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

This symbol on an RJ-45 receptacle indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.
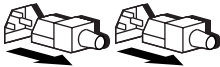
These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg
Weight in lb

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Rack Stability

⚠ **WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:**

- **The leveling jacks are extended to the floor.**

- **The full weight of the rack rests on the leveling jacks.**

- **The stabilizing feet are attached to the rack if it is a single-rack installation.**

- **The racks are coupled together in multiple-rack installations.**

- **Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.**

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

⚠ **WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.**

△ **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents essential information to explain a concept or complete a task.

NOTE: Text set off in this manner presents additional information to emphasize or supplement important points of the main text.

Related Documents

For additional information on the topics covered in this guide, refer to the following documentation:

- *HP ProLiant BL System Best Practices Guide*

- *HP ProLiant BL System Common Procedures Guide*

- *HP ProLiant BL p-Class System Hardware Installation and Configuration Poster*

- White Paper: *HP ProLiant BL p-Class System Overview and Planning*

- *HP ROM-Based Setup and Utility User Guide*

- *HP Integrated Lights-Out User Guide*

- *HP ProLiant BL p-Class System Maintenance and Service Guide*

- *HP ProLiant Servers Troubleshooting Guide*

- HP ProLiant BL20p Generation 3 Server Blade QuickSpecs

- *HP StorageWorks Booting Windows Systems from a Storage Area Network*

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Technical Support

In North America, call the HP Technical Support Phone Center at 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored. Outside North America, call the nearest HP Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the HP website, www.hp.com.

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)

- Product serial number

- Product model name and number

- Applicable error messages

- Add-on boards or hardware

- Third-party hardware or software

- Operating system type and revision level

HP Website

The HP website has information on this product as well as the latest drivers and flash ROM images. You can access the HP website at www.hp.com.

Authorized Reseller

For the name of the nearest authorized reseller:

- In the United States, call 1-800-345-1518.

- In Canada, call 1-800-263-5868.

- Elsewhere, see the HP website for locations and telephone numbers.

Reader's Comments

HP welcomes your comments on this guide. Please send your comments and suggestions by e-mail to ServerDocumentation@hp.com.

1

Server Blade Component Identification

LEDs

The system contains several sets of LEDs that indicate the status and settings of hardware components. Use the following sections to determine the location and functions of LEDs on these components:

- ProLiant BL20p Generation 3 server blade front panel

- Hot-plug SCSI hard drive

Server Blade Front Panel

Seven LEDs on the front of the server blade indicate server status. Use Figure 1-1 and Table 1-1 to identify LED locations and functions.
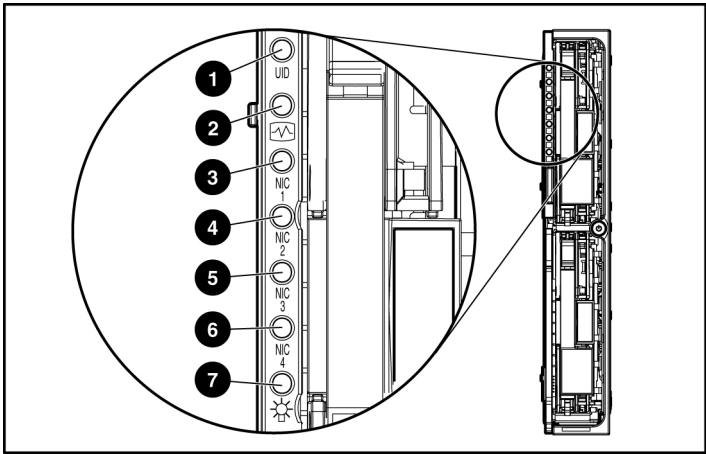
Figure 1-1: ProLiant BL20p G3 server blade front panel LEDs

Table 1-1: ProLiant BL20p G3 Server Blade Front Panel LEDs

Item	LED Description	Status
1	Unit identification (UID)	Blue = Flagged
		Blue flashing = Management mode
		Off = No remote management
2	Health	Green = Normal status
		Flashing = Booting
		Amber = Degraded status
		Red = Critical status

continued

Table 1-1: ProLiant BL20p G3 Server Blade Front Panel LEDs *continued*

Item	LED Description	Status
3	NIC 1*	Green = Linked to network
4	NIC 2*	Green flashing = Network activity
5	NIC 3*	Off = No activity
6	NIC 4*	
7	Power	Green = On
		Amber = Standby (power available)
		Off = Unit off

*Actual NIC numeration depends on factors such as which operating system is installed on the server.

Hot-Plug SCSI Hard Drive

Each hot-plug SCSI hard drive has three LEDs located on the front of the drive. The LEDs provide activity, online, and fault status for each corresponding drive when configured as a part of an array and attached to a powered-on Smart Array controller. Their behavior may vary depending on the status of other drives in the array. Use Figure 1-2 and Table 1-2 to identify LED locations and functions.

⚠️ **WARNING: Before removing a hard drive, read the hot-plug hard drive replacement section in the *HP ProLiant Servers Troubleshooting Guide.***

- The first LED indicates drive activity status (1), where on indicates activity and off indicates no activity by the drive.

- The second LED indicates online status (2), where flashing indicates an active online condition and off indicates an inactive online condition.

- The third LED indicates fault status (3), where flashing indicates fault-process activity and off indicates a no-fault-process activity.
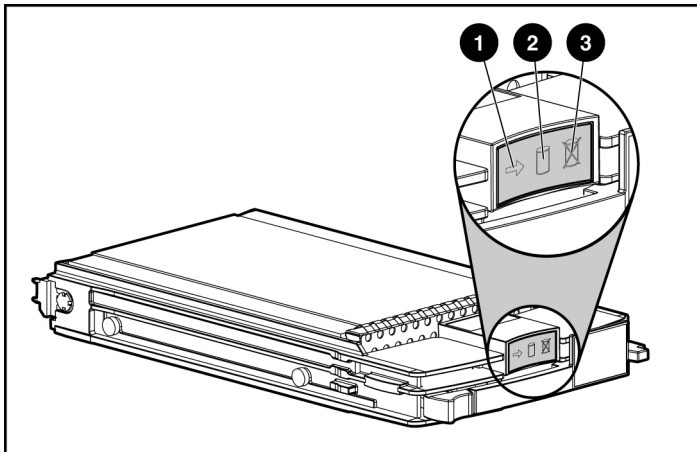
Figure 1-2: Hot-plug SCSI hard drive LEDs

Table 1-2: Hot-Plug SCSI Hard Drive LED Status Combinations

(1) Activity	(2) Online	(3) Fault	Description
On	Off	Off	**Do not remove the drive. Removing a drive during this process causes data loss.**
			The drive is being accessed and is not configured as part of an array.
On	Flashing	Off	**Do not remove the drive. Removing a drive during this process causes data loss.**
			The drive is rebuilding or undergoing capacity expansion.
Flashing	Flashing	Flashing	**Do not remove the drive. Removing a drive during this process causes data loss.**
			The drive is part of an array being selected by the Array Configuration Utility.
			-Or-
			The Options ROMPaq is upgrading the drive.
Off	Off	Off	OK to replace the drive online if a predictive failure alert is received and the drive is attached to an array controller.
			The drive is not configured as part of an array.
			-Or-
			If this drive is part of an array, a powered-on controller is not accessing the drive.
			-Or-
			The drive is configured as an online spare.
Off	Off	On	OK to replace the drive online.
			The drive has failed and has been placed offline.

continued

Table 1-2: Hot-Plug SCSI Hard Drive LED Status Combinations *continued*

(1) Activity	(2) Online	(3) Fault	Description
Off	On	Off	OK to replace the drive online if a predictive failure alert is received, provided that the array is configured for fault tolerance and all other drives in the array are online.
			The drive is online and configured as part of an array.
On or flashing	On	Off	OK to replace the drive online if a predictive failure alert is received, provided that the array is configured for fault tolerance and all other drives in the array are online.
			The drive is online and being accessed.

Power Button

Setting the server blade power button to the standby position removes power from most areas of the server blade. This process may take 30 seconds, during which time some internal circuitry remains active.

IMPORTANT: To remove power completely, remove the server blade from the server blade enclosure.

Use Figure 1-3 to identify the button location.
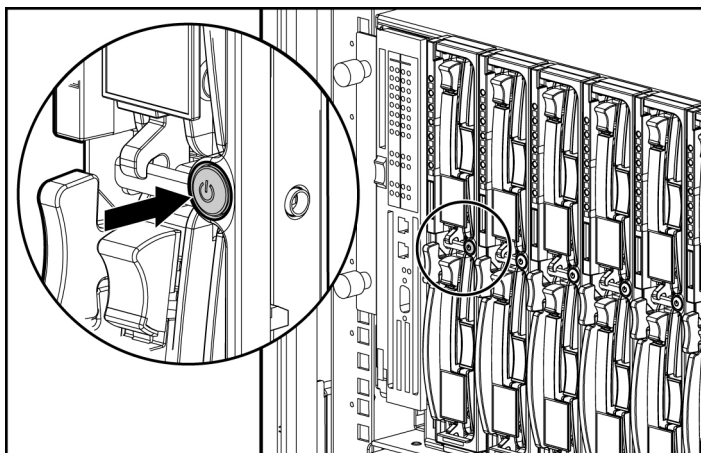
Figure 1-3: Power button

System Switches

System switches enable you to change certain settings or to perform advanced diagnostic procedures. Use Figure 1-4 and Table 1-3 to identify switch locations and functions.
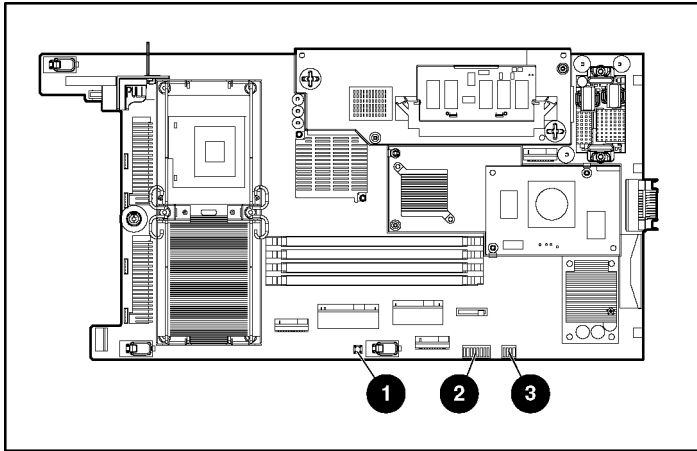
Figure 1-4: Server blade switches

Table 1-3: Server Blade Switches

Item	Description
1	NMI switch
2	System maintenance switch (SW2)
3	System settings switch (SW1)

NMI Switch

The non-maskable interrupt (NMI) switch is for use by trained service personnel only. Refer to the *HP ProLiant BL p-Class System Maintenance and Service Guide* for more information.

System Maintenance Switch

The system maintenance switch (SW2) is an eight-position switch that implements protection and override functions. The default position is off. For the proper system maintenance switch settings, refer to Table 1-4 or refer to the labels attached to the inside of the server access panel.

Table 1-4: System Maintenance Switch (SW2) Settings

Position	Description	On/Off Function
1	iLO Security Override	Off = iLO Security is enabled.
		On = Overrides iLO security function.
2	Configuration lock	Off = System configuration can be modified.
		On = System configuration is locked and cannot be modified.
3	Reserved	The default is OFF.
4	Reserved	The default is OFF.
5	Password Disable	Off = Power-on password is enabled.
		On = Power-on password is disabled.
6	Reset Configuration	Off = Normal.
		On = ROM treats the system configuration as invalid.
7	Reserved	The default is OFF.
8	Reserved	The default is OFF.

System Settings Switch

The system settings switch (SW1) is a four-position switch with all four settings reserved. The default setting for all four positions is off.

Identifying System Board Components

Use Figure 1-5 and Table 1-5 to identify the system board components and connectors.
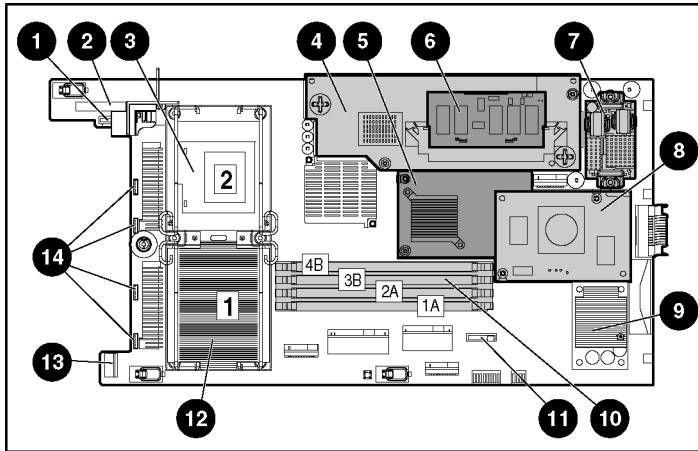
Figure 1-5: System board components and connectors

Table 1-5: System Board Components and Connectors

Item	Description
1	Power button/LED board connector
2	SCSI backplane board connector 1
3	Processor socket 2
4	Smart Array 6i Controller
5	Standard NIC Mezzanine card
6	Smart Array 6i 128-MB Battery-Backed Write Cache Enabler (Optional)
7	Power converter module
8	HP ProLiant BL20p G3 Dual Port Fibre Channel adapter (Optional)

continued

Table 1-5: System Board Components and Connectors continued

Item	Description
9	DC filter module
10	DIMM slots (4)
11	System Battery
12	Processor socket 1 (populated)
13	SCSI backplane board connector 2
14	Fan connectors

Identifying Local I/O Cable Connectors

Use Figure 1-6 and Table 1-6 to identify the local I/O cable connectors.
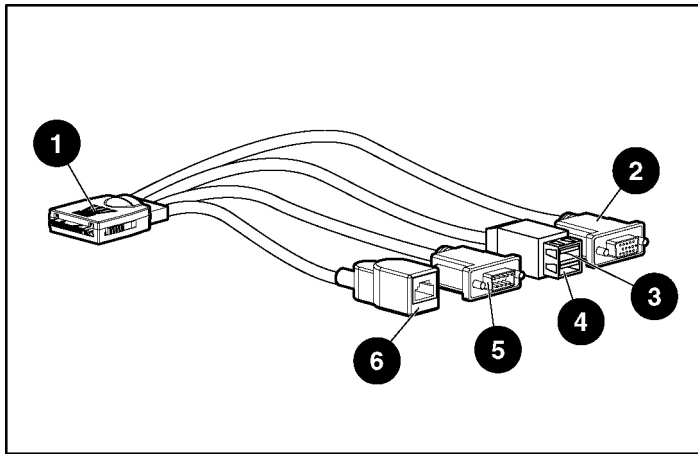
Figure 1-6: Local I/O Cable Connectors

Table 1-6: Local I/O cable connectors

Item	Connector Name	Connector Description
1	Server blade connector	Attaches to the I/O port on the front of the server blade.
2	Video connector	Provides video capability.
3	USB connector 1	Provides USB connection enabling direct connection to the server blade.
4	USB connector 2	Provides USB connection enabling direct connection to the server blade.
5	Serial connector	Requires a null modem serial cable and enables trained personnel to perform advanced diagnostic procedures.
6	iLO RJ-45 (10/100 Ethernet) connector	Provides an Ethernet connector through which you can access the server blade iLO interface from a client device.

2

Server Blade Operations

Powering Up the Server Blade

By default, server blades are set to power up automatically when installed in a server blade enclosure. If you changed this setting, use one of the following methods to power up the server blade:

- Power button

  — A momentary press initiates a power-up request. The system detects if power is available from the power subsystem to power on the server blade. If power is available, then the server blade powers on.

  — A long press, 5 or more seconds, initiates a power-up override. The server blade is powered on without detecting available power.

  > **CAUTION:** Always observe iLO alerts before initiating a power-up override to prevent a hot-plug power supply fault and possible loss of system power. Refer to the *HP Integrated Lights-Out User Guide* for more information.

  NOTE: You may choose to perform a power-up override to power up a server blade and to override the power-up request function when the management modules are not in use and when you know that sufficient power is available.

- Virtual power button features through the iLO remote console

  — A momentary power-up selection

  — A hold power-up selection

For more information about iLO, refer to Chapter 5, "Server Blade Configuration and Utilities."

Powering Down the Server Blade

The ProLiant BL20p Generation 3 server blade can be powered down in either of the following ways:

- Use the virtual power button feature in the iLO remote console to power down the server blade from a remote location. Be sure that the server blade is in standby mode by observing that the power LED is amber. For iLO information and procedures, refer to the *HP Integrated Lights-Out User Guide*.

- Press the power button on the front of the server blade. Be sure that the server blade is in standby mode by observing that the power LED is amber. This process may take 30 seconds, during which time some internal circuitry remains active.

IMPORTANT: To remove power completely form the server blade, remove the server blade from the server blade enclosure.

3

Server Blade Setup

Accessing Internal Server Blade Components

⚠ **WARNING: To reduce the risk of electric shock, do not power up the server blade with the access panel removed.**

⚠ **WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.**

⚠ **CAUTION:** Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix D, "Electrostatic Discharge," for more information.

IMPORTANT: If the server blade is not installed in the server blade enclosure or is not receiving power through the diagnostic station, begin with step 4.

1. Identify the proper server blade in the server blade enclosure.

2. Remove power from the server blade. Refer to "Powering Down the Server Blade" in Chapter 2, "Server Blade Operations."

⚠ **CAUTION:** After you press the release button, the server blade is unlocked from the server blade enclosure. Use both hands to support the server blade when you remove it from the rack.

3. Remove the server blade from the server blade enclosure. Refer to "Removing a Server Blade from a Server Blade Enclosure" in this chapter.

4. Place the server blade on a flat, level surface.

5. Remove the access panel. Refer to "Removing the Server Blade Access Panel" in this chapter.

Removing the Server Blade Access Panel

⚠ **WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.**

△ **CAUTION:** Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix D, "Electrostatic Discharge," for more information.

⚠ **WARNING: To reduce the risk of electric shock, do not power up the server blade with the access panel removed.**

1. Loosen the thumbscrew on the rear of the server blade (1).

2. Slide the access panel about 1 cm (3/8 in) toward the rear of the unit and lift the panel to remove it (2).
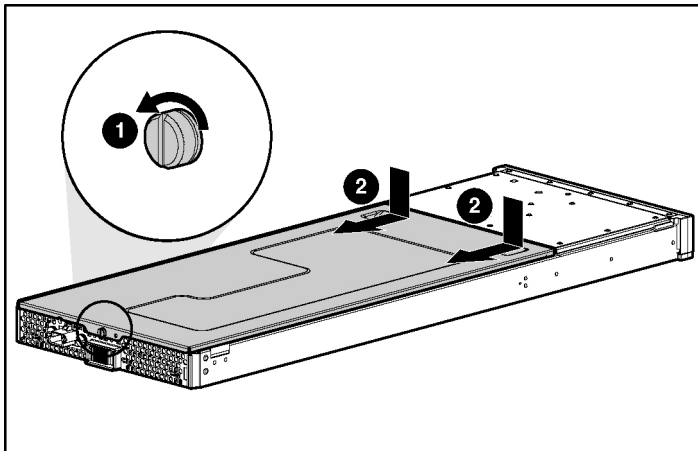
Figure 3-1: Removing the access panel

To install the access panel, reverse the removal procedure.

Removing a Server Blade Blank

⚠ **CAUTION:** Always populate the server blade enclosure bays with either a server blade or a server blade blank. Unpopulated bays can lead to improper cooling and thermal damage.

1. Press the release buttons (1).

2. Slide the server blade blank out of the bay (2).
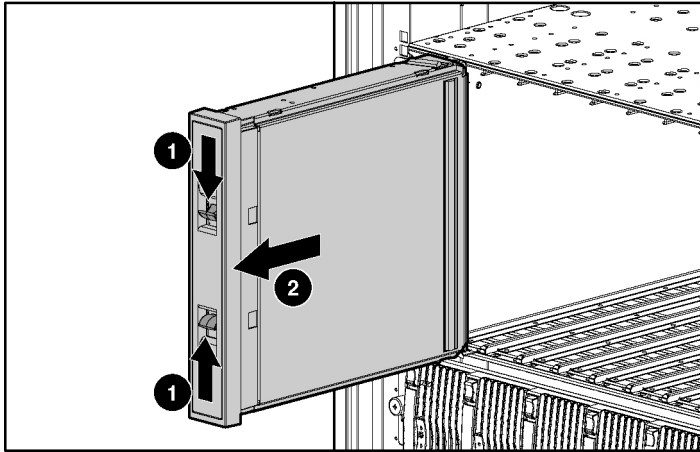
Figure 3-2: Removing a server blade blank

NOTE: Store the server blade blank for future use.

Installing a Server Blade

Before installing server blades for the first time, define the hardware configuration and server blade deployment process. Refer to Chapter 5, "Server Blade Configuration and Utilities."

⚠ **CAUTION:** Always populate the server blade enclosure bays with either a server blade or server blade blank. Unpopulated bays can lead to improper cooling and thermal damage.

---

1. Align the keyed end of the server blade with the guide at the end of a bay on the server blade enclosure.

    IMPORTANT: The server blade is keyed to fit only one way in the bay. If the server blade does not slide easily into the bay, be sure that the server blade is oriented properly.

2. Install the server blade by sliding the server blade fully into the bay (1).

3. Close the ejector lever (2).
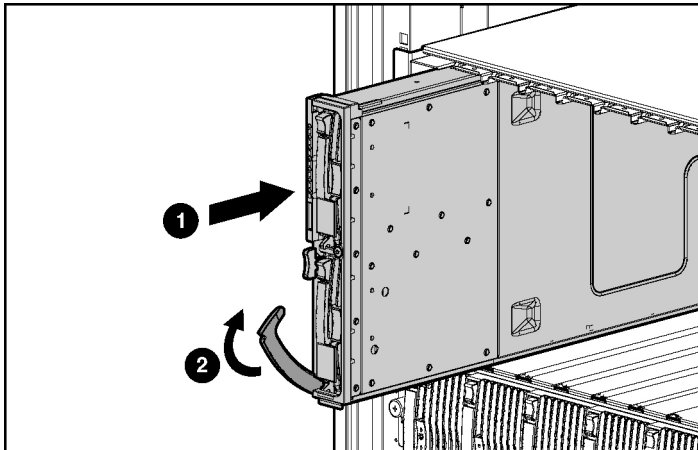
Figure 3-3: Installing a server blade

Removing a Server Blade from a Server Blade Enclosure

1. Press the release button (1).

   ⚠️ **CAUTION:** After you press the release button, the server blade is unlocked from the server blade enclosure. Use both hands to support the server blade when you remove it from the rack.

2. Open the release lever (2).

3. Grasp the lever and slide the server blade from the server blade enclosure (3). Place a hand under the server blade to support it as you remove it from the server blade enclosure.
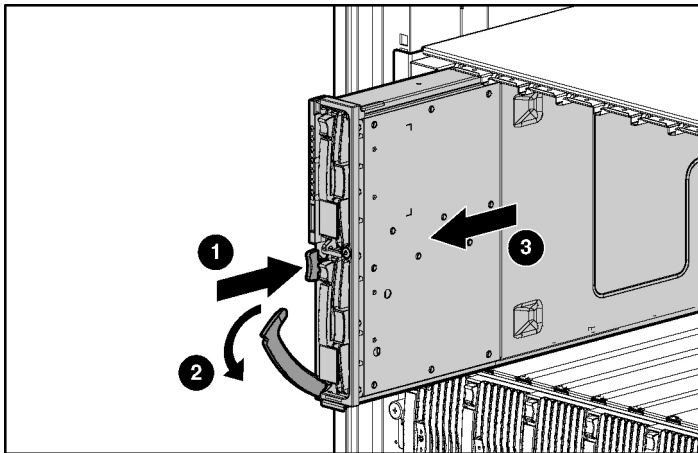
Figure 3-4: Removing a server blade

4

Hardware Options Installation

Processors and Heatsinks

The ProLiant BL20p G3 server blade ships with one or two processors.

⚠ **WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.**

⚠ **WARNING: This documentation assumes that the server blade is in a rack and not receiving power from a diagnostic station. If using a diagnostic station, be sure to disconnect the server blade from the diagnostic station before installing a processor.**

⚠ **CAUTION:** Properly ground yourself before beginning any installation procedure. Electrostatic discharge can damage electronic components.

⚠ **CAUTION:** Handle the processor with care. Do not bend or damage the pins beneath the processor.

Installation and Upgrade Requirements

Observe the following requirements before installing a processor in the server blade:

- Before installing a processor in the server, processor socket 1 must always be populated. If the processor is missing from socket 1, the system will not power on.

- If processors of differing speeds are installed, each processor matches the speed of the slowest processor.

Removing a Processor and Heatsink

For information on accessing internal server blade components, refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."

IMPORTANT: The heatsink is not reusable and must be discarded if removed from the processor after application.
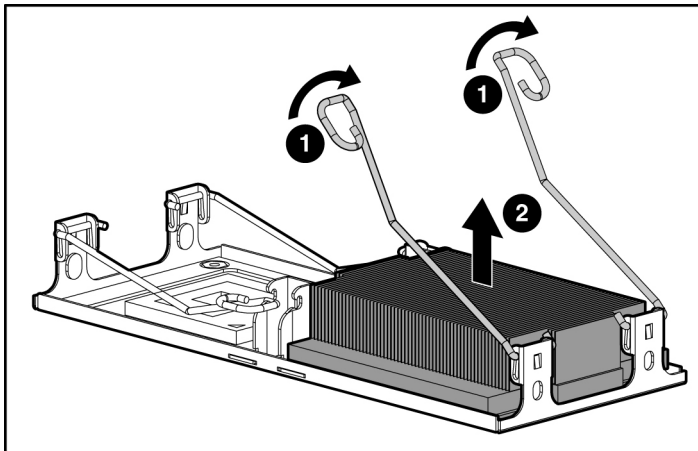
Figure 4-1: Unlatching the heatsink locking levers and removing the heatsink
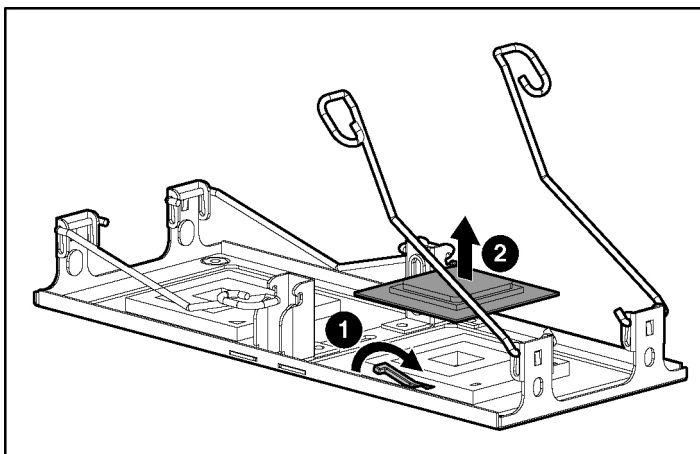
Figure 4-2: Removing the processor

Installing a Processor

> **IMPORTANT:** The processor and heatsink are designed to fit one way into the socket. Align the arrow on the processor with the arrow on the processor socket.

> **IMPORTANT:** Be sure that the processor locking lever is open before installing the processor into the socket.
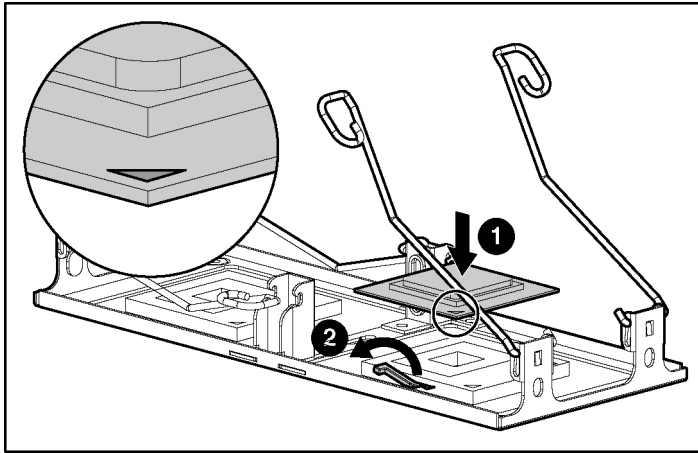
Figure 4-3: Installing a processor

⚠ **CAUTION:** Be sure that the processor locking lever is closed. Do not force the lever closed after the processor installation; it should close without resistance. Forcing the lever closed may result in damage to the processor and its socket, requiring replacement of the system board.
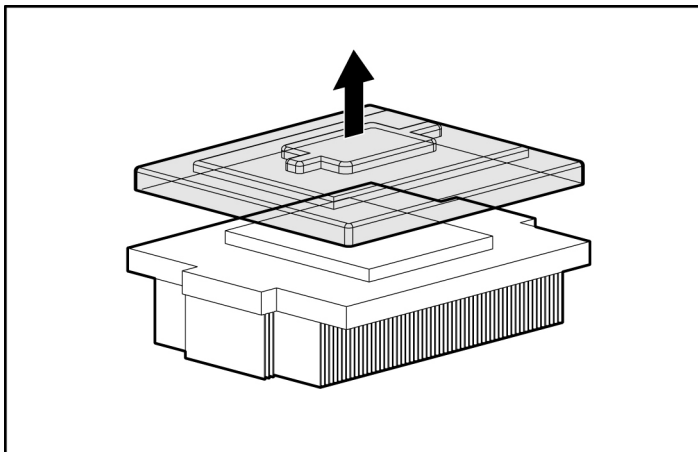
Figure 4-4: Removing the thermal interface media cover

△ **CAUTION:** After the cover is removed, do not touch the thermal interface media.

IMPORTANT: The heatsink is not reusable and must be discarded if removed from the processor after application.
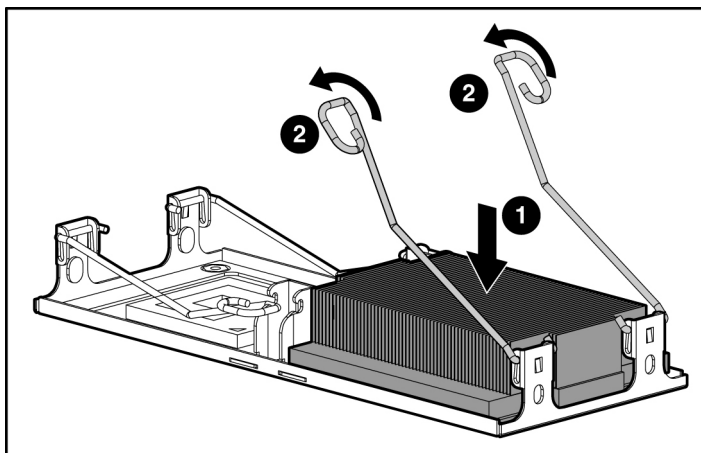
Figure 4-5: Installing a heatsink

Hot-Plug SCSI Hard Drives and Blanks

Removing Hard Drive Blanks

△ **CAUTION:** Always populate drive bays with either a hard drive or blank. Proper airflow can only be maintained when the bays are populated. Unpopulated drive bays can lead to improper cooling and thermal damage.

NOTE: Port-colored items indicate hot-plug components.
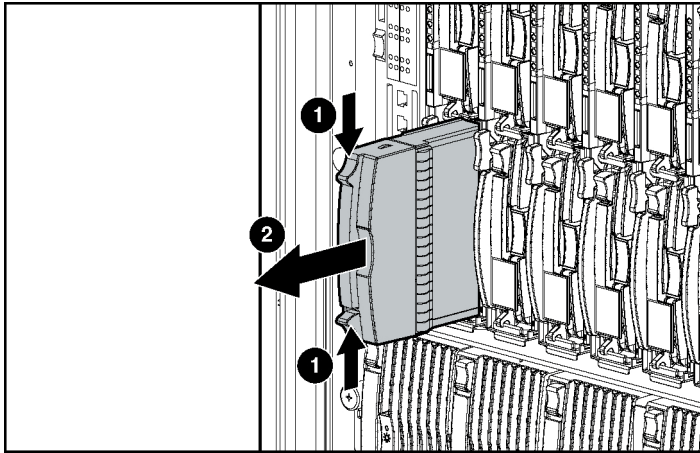
Figure 4-6: Removing a hard drive blank

NOTE: Store the hard drive blank for future use.

To install a hard drive blank, simply align the blank with the empty bay and slide the blank into the bay until the locking button engages.

SCSI ID Numbers

The server blade hot-plug SCSI hard drives have unique SCSI IDs that the system automatically sets. The IDs number from top to bottom on each server blade.

IMPORTANT: Always populate hard drive bays starting with SCSI ID 0 (the top bay).

Removing Hot-Plug SCSI Hard Drives

Before removing hot-plug SCSI hard drives, back up all server data on the hard drive.

> **CAUTION:** Before removing a hot-plug SCSI hard drive, use the LEDs to determine the status of the drive. Refer to the "Hot-Plug SCSI Hard Drive" section in Chapter 1, "Server Blade Component Identification."

> ⚠ **CAUTION:** If you are replacing a drive that is part of an array, refer to the *HP ProLiant Servers Troubleshooting Guide*.
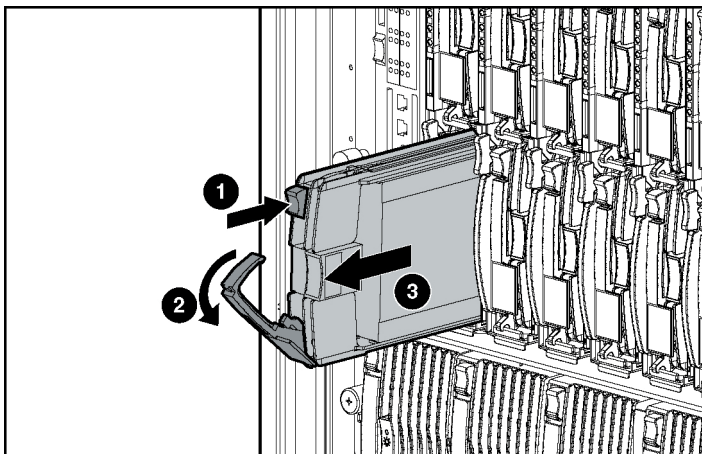
Figure 4-7: Removing a hot-plug SCSI hard drive

Installing Hot-Plug SCSI Hard Drives

1. Remove the existing hard drive blank or SCSI hard drive from the bay. Refer to "Removing Hard Drive Blanks" or "Removing Hot-Plug SCSI Hard Drives" in this chapter.

2. Insert the hot-plug SCSI hard drive. Be sure the drive seats firmly into the connector on the SCSI backplane (1).

3. Close the ejector lever (2).
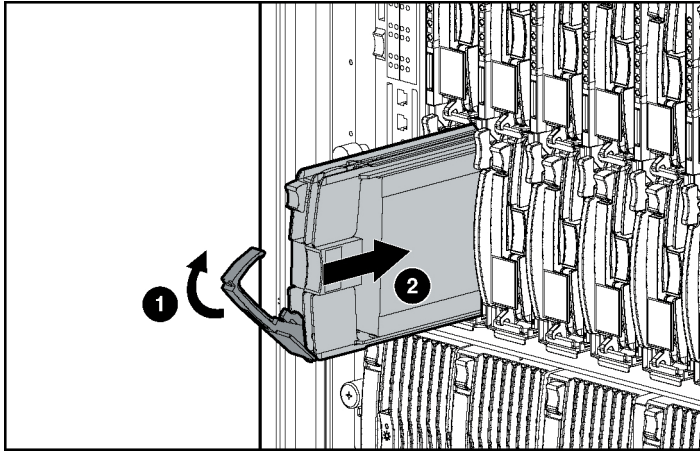
Figure 4-8: Installing a hot-plug SCSI hard drive

4. If you replaced a hard drive, restore the server blade data from the backup.

5. Use the hot-plug SCSI hard drive LEDs to identify the status of the installed drive. For more information about LEDs, refer to "Hot-Plug SCSI Hard Drive" in Chapter 1, "Server Blade Component Information."

6. Resume normal server blade operations.

Memory

You can expand system memory by installing synchronous DDR DIMMs. A ProLiant BL20p G3 server blade supports up to four PC2-3200 ECC registered DDR SDRAM DIMMs.

DIMM Installation Guidelines

You must observe the following guidelines when installing additional memory:

- Install only PC2-3200 registered DDR, 3.3-V, 72-bit wide, ECC DIMMs in the server blade.

- Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.

- Populate both slots in a bank at the same time: DIMMs 1 and 2 reside in bank A, and DIMMs 3 and 4 reside in bank B.

  NOTE: The server blade ships with at least two DIMMs installed in DIMM slots 1A and 2A.

  CAUTION: Use only HP DIMMs. DIMMs from other sources are known to adversely affect data integrity.

Installing DIMMs

Before installing DIMMs, review the "DIMM Installation Guidelines" section in this chapter.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix D, "Electrostatic Discharge," for more information.

1. Access the internal server blade components. Refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."

2. Open the DIMM slot latches.

3. Align the key slot in the bottom edge of the DIMM with the tab in the DIMM slot.

   IMPORTANT: DIMMs do not seat if turned the wrong way.

4. Insert the DIMM into the DIMM slot (1).

5. Press down firmly. When the DIMM seats fully in the slot, the latches close (2).
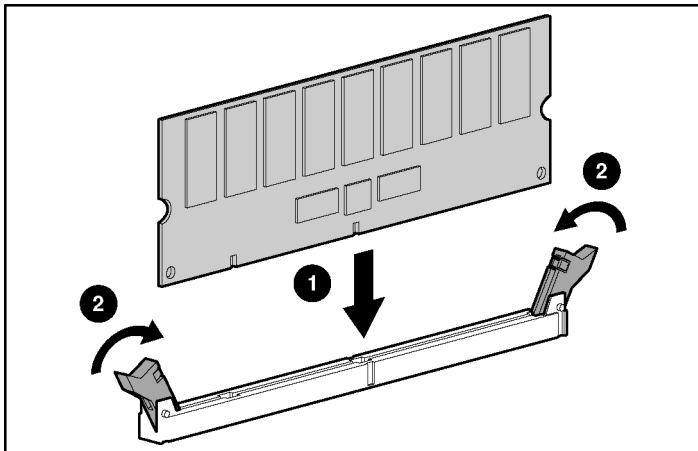
Figure 4-9: Installing a DIMM

6. Repeat steps 2 through 5 to install the second DIMM.

7. Reinstall the access panel. Refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."

Smart Array 6i 128-MB Battery-Backed Write Cache Enabler

The optional Battery-Backed Write Cache Enabler provides the system with a means for storing and saving data in the event of an unexpected system shutdown.

To access the internal server blade components, refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."
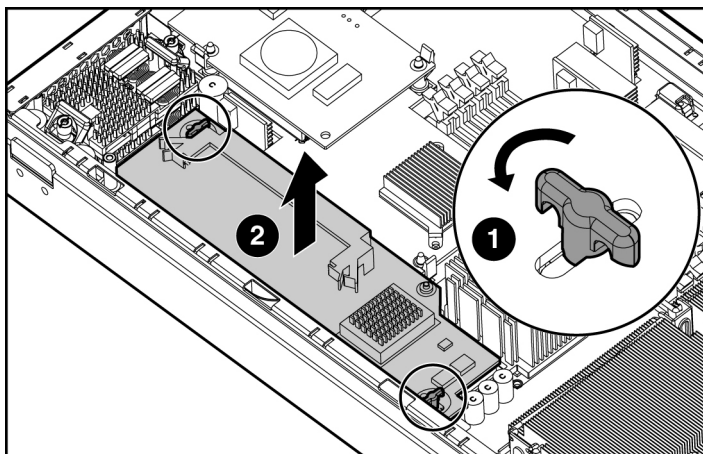
Figure 4-10: Removing the Smart Array 6i Controller

NOTE: Before removing the battery from the carrier, be sure to unwrap the cable.
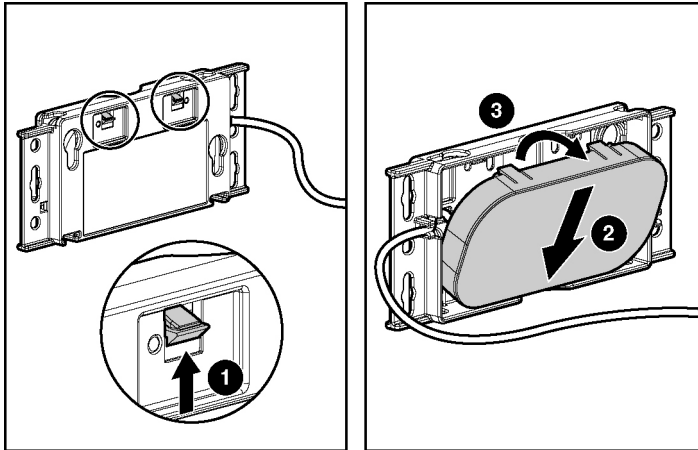
Figure 4-11: Removing the battery from the plastic carrier

NOTE: After removing the battery from the plastic carrier, discard the carrier and the cable. The only items required for use with the HP ProLiant BL20p Generation 3 server blade are the battery and the 128-MB Battery-Backed Write Cache Enabler.
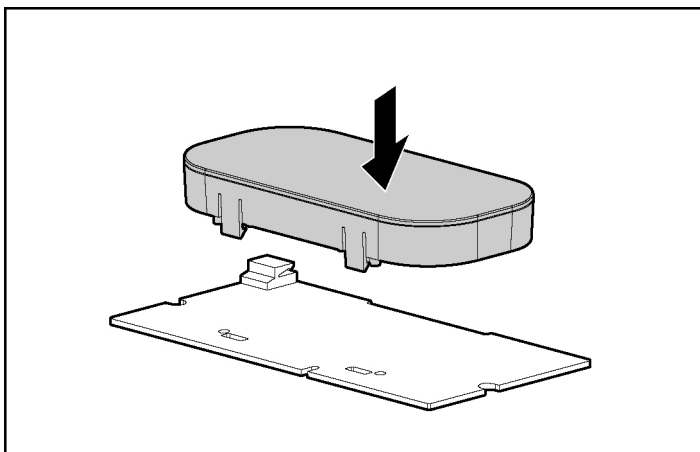
Figure 4-12: Installing the battery onto the Smart Array 6i 128-MB Battery-Backed Write Cache Enabler
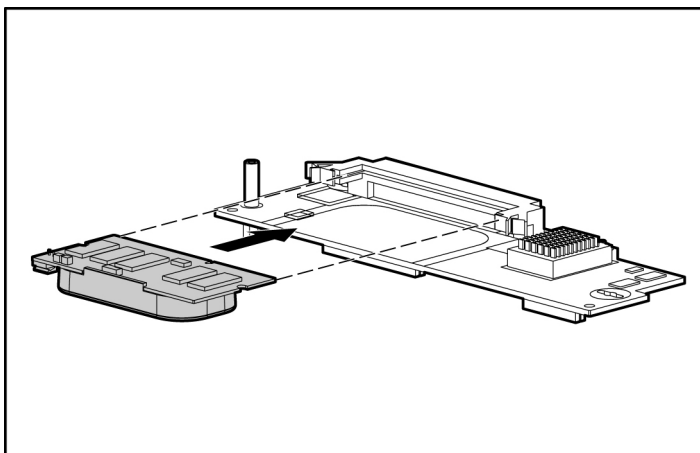
Figure 4-13: Installing the Smart Array 6i 128-MB Battery-Backed Write Cache Enabler onto the Smart Array 6i controller
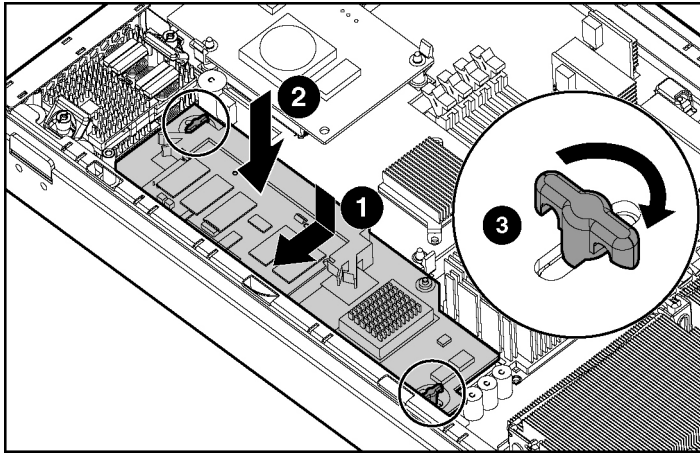
Figure 4-14: Installing the Smart Array 6i controller

To reinstall the access panel, refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."

HP ProLiant BL20p G3 Dual Port Fibre Channel Adapter

An optional dual port Fibre Channel (FC) adapter enables FC support for clustering capabilities and SAN connection when used in conjunction with the RJ-45 Patch Panel 2 or any other interconnect that supports a SAN connection. Refer to "SAN Configuration Overview" in Chapter 5, "Server Blade Configuration and Utilities" for more information about connecting to the SAN.

To remove the access panel, refer to "Accessing Internal Server Blade Components" in Chapter 3, "Server Blade Setup."
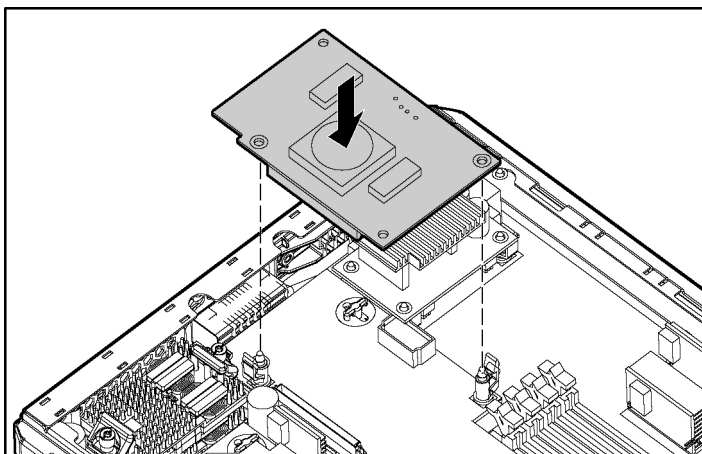
Figure 4-15: Installing the FC adapter

5

Server Blade Configuration and Utilities

This chapter contains information about server blade deployment methods, hardware configuration, and the software to accomplish these tasks.

Software and Utilities

The following utilities and support tools are available for use in configuring and deploying the server blade:

- Integrated Lights-Out Advanced (iLO Advanced) Management

- Redundant ROM Support

- Remote ROM Flash

- ROMPaq Utility

- ROM-Based Setup Utility (RBSU)

- Fan Redundancy

- ProLiant Power Governor

- Option ROM Configuration for Arrays (ORCA) Utility

- Network-based PXE Deployment

- HP Systems Insight Manager (HP SIM)

- Diagnostics Utility

- Automatic Server Recovery (ASR-2)

- Integrated Management Log (IML)

HP also offers the following software components:

- Health and Wellness Driver and IML Viewer

- iLO Advanced Management Interface Driver

- Rack Infrastructure Interface Service

- Management Agents

For Microsoft® Windows® operating system users, these items are included in the ProLiant Support Pack for Microsoft Windows, available from the ProLiant BL p-Class system product page at

h18002.www1.hp.com/support/files/server/us/index.html

Linux operating system users can download these components from the HP website:

www.hp.com/products/servers/linux/

For information on how to use these components with a Linux operating system, refer to the HP website:

http://h18000.www1.hp.com/products/servers/linux/documentation.html#howtos

Integrated Lights-Out Advanced Management

Integrated Lights-Out Advanced (iLO Advanced) is a standard component of selected ProLiant server blades. The iLO Advanced subsystem provides server health and remote server blade manageability. The iLO Advanced features are accessed from a network client device using a supported web browser. In addition to other features, iLO Advanced provides keyboard, mouse, and video (text and graphics) capability for a server blade, regardless of the state of the host operating system or host server blade.

iLO includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO independent of the host server blade and its operating system. iLO provides remote access to any authorized network client, sends alerts, and provides other server blade management functions.

Using a supported web browser, you can:

- Remotely access the console of the host server blade, including all text mode and graphics mode screens with full keyboard and mouse controls.

- Remotely power up, power down, or reboot the host server blade.

- Remotely boot a host server blade to a virtual diskette image to perform a ROM upgrade or to install an operating system.

- Send alerts from iLO Advanced regardless of the state of the host server blade.

- Access advanced troubleshooting features provided by iLO Advanced.

- Launch a web browser, use Simple Network Management Protocol (SNMP) alerting, and diagnose the server blade using HP SIM.

- Configure static IP bay settings for the dedicated iLO management NICs on each server blade in an enclosure for faster deployment.

The server blade must be properly cabled for iLO connectivity. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack): This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).

- Through the server blade I/O port

— In the rack: This method requires you to connect the local I/O cable to the I/O port and a client PC. Using the static IP address listed on the local I/O cable label and the initial access information on the front of the server blade, you can access the server blade with the iLO Advanced Remote Console. For local I/O cabling instructions, refer to Chapter 6, "Connecting Local I/O Devices."

— Out of the rack, with the diagnostic station: This method requires you to power the server blade with the optional diagnostic station and connect to an external computer using the static IP address and the local I/O cable. For cabling instructions, refer to the documentation that ships with the diagnostic station or to the Documentation CD.

- Through the server blade rear panel connectors (out of the rack, with the diagnostic station): This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

iLO ROM-Based Setup Utility

The iLO ROM-Based Setup Utility (iLO RBSU) is the recommended method to configure and set up iLO. The iLO RBSU is designed to assist you with setting up iLO on a network and is not intended for continued administration.

To run iLO RBSU:

1. Restart or power up the server blade.

2. Press the **F8** key when prompted during the Power-On Self-Test (POST). The iLO RBSU runs.

3. Enter a valid iLO user ID and password with the appropriate iLO privileges (Administer User Accounts, Configure iLO Settings).

4. Make and save any necessary changes to the iLO configuration.

5. Exit iLO RBSU, when finished.

HP recommends using the static IP bay configuration feature on iLO or DNS/DHCP with iLO to simplify installation. If DNS/DHCP cannot be used, use one of the following procedures to disable DNS/DHCP and to configure the IP address and the subnet mask:

1. Log into iLO using the DNS/DHCP IP address.

2. At the Administration screen, enter a valid iLO user ID and password with the appropriate iLO privileges.

3. Select **Network Settings** and enter the appropriate information.

or

- Restart or power up the server blade.

- Press the **F8** key when prompted during the POST. The iLO RBSU runs.

- Enter a valid iLO user ID and password with the appropriate iLO privileges (Administer User Accounts, Configure iLO Settings).

    NOTE: Use the arrow keys to highlight selections.

- Select **Network, DNS/DHCP,** press the **Enter** key, and then select **DHCP Enable.** Press the spacebar to turn off DHCP. Be sure that DHCP Enable is set to **Off** and save the changes.

- Select **Network, NIC** and **TCP/IP,** press the **Enter** key, and type the appropriate information in the **IP Address, Subnet Mask** and **Gateway IP Address** fields.

- Save the changes. The iLO system automatically resets to use the new setup when you exit the iLO RBSU.

Redundant ROM Support

Server blades enable you to upgrade or configure the ROM safely with redundant ROM support. The server blade has a 4-MB ROM that acts as two, separate 2-MB ROMs. In the standard implementation, one ROM contains the current ROM program version, while the other ROM contains a backup version.

Safety and Security Benefits

When you flash the system ROM, ROMPaq writes over the older ROM and saves the current ROM as a backup, enabling you to switch easily to the backup ROM version if the new ROM becomes corrupted for any reason. This feature protects the previous ROM version, even if you experience a power failure while flashing the ROM.

Access to Redundant ROM Settings

To access the redundant ROM:

1. Access RBSU by pressing the **F9** key during power up when the prompt displays.

2. Select **Advanced Options**.

3. Select **ROM Selection**.

4. Select one of the ROM banks as the system ROM.

5. Press the **Enter** key.

6. Press the **Esc** key to exit the current menu or press the **F10** key to exit RBSU.

7. Restart the server blade.

When the server blade boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST or IML that the ROM bank is corrupt.

If both the current and backup versions of the ROM are corrupt, you must return the system board for a service replacement. Refer to the *HP ProLiant BL p-Class System Maintenance and Service Guide* and contact an HP authorized reseller.

Remote ROM Flash

The system contains individual firmware for various components.

The ProLiant BL20p G3 server blade contains:

- Server blade system ROM

- Smart Array 6i memory module ROM

- iLO ROM

The server blade and power enclosures contain:

- Server blade management module ROM

- Power management module ROM

Using the Smart Components for Remote ROM Flash with the Remote Deployment Utility (RDU) console application, Remote ROM Flash enables you to upgrade the firmware (BIOS) on a server blade from a remote location.

If a power loss occurs during a firmware upgrade, redundant ROM support enables data recovery.

ROMPaq Utility

Flash ROM enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities.

To upgrade the BIOS:

1. Download the latest ROMPaq at www.hp.com/support.

2. Follow the instructions and create a bootable diskette.

   IMPORTANT: You can use the iLO Virtual Media applet to create the image file. Refer to the "Integrated Lights-Out Advanced Management" section in this chapter. If you use this method, omit step 3.

3. Access the server blade through the iLO Remote Console. Refer to the *HP ProLiant BL p-Class System Hardware Configuration and Installation Poster.*

4. Insert the virtual diskette.

5. Use the iLO virtual power button to power the server blade off and then on, and to set the blade to boot from the diskette image you created in step 2.

The ROMPaq Utility checks the system and provides a choice (if more than one exists) of available ROM revisions. By default, the oldest ROM version is updated. This procedure is the same for both system and option ROMPaq utilities.

If a power loss occurs during a firmware upgrade, redundant ROM support enables data recovery.

ROM-Based Setup Utility

NOTE: Most of the features in RBSU are not required in the setup of the server blade. The options in this utility are designed to assist with specific server blade configuration issues.

RBSU performs configuration activities and enables you to view server blade configuration information. The server blade ships pre-configured, and changes are not required unless you want to change the default settings.

To navigate RBSU, use the following keys:

- To access RBSU, use the iLO Remote Console and press the **F9** key when prompted during power up.

- To navigate the menu system, use the arrow keys.

- To make selections, press the **Enter** key.

RBSU automatically saves settings when you press the **Enter** key. The utility does not prompt you for confirmation of settings before you exit the utility. To change a selected setting, you must select a different setting and press the **Enter** key.

Table 2-1 contains the default settings for options in primary RBSU menus.

Table 5-1: RBSU Default Settings

Menu/Option	Default Setting
System Options	
OS Selection	
Embedded Serial Port	
Virtual Serial Port	
Integrated Diskette Controller	
Embedded NIC PXE Support	Port 1 PXE Enabled
USB Control	USB Enabled
USB 2.0 Control	Enabled
Standard Boot Order (IPL)	*
Boot Controller Order	Smart Array 6i
Server Availability	
ASR Status	Enabled
ASR Timeout	10 minutes
Thermal Shutdown	Enabled
*The default boot order is CD-ROM drive, diskette drive, hard drive, and network, respectively.	

continued

Table 5-1: RBSU Default Settings *continued*

Menu/Option	Default Setting
Wake-on LAN	Enabled
POST Speed Up	Enabled
POST F1 Prompt	Enabled
Power Button	Enabled
Fan Redundancy	Enabled
Server Passwords	
Set Power-On Password	Disabled
Set Admin Password	Disabled
BIOS Serial Console & EMS	
BIOS Serial Console Port	Auto
BIOS Serial Console Baud Rate	9600
EMS Console	COM 1; IRQ 4
BIOS Interface Mode	Auto
Server Asset Text	
Server Info Text	
Administrator Info Text	
Service Contact Text	
Custom Post Message	Disabled
Advanced Options	
MPS Table Mode	AutoSet Table
ROM Selection	Use Current ROM
Erase Non-Volatile Memory	Disabled
Erase NVRAM/Boot Disk	Disabled
NMI Debug Button	Enabled
Processor Hyper-Threading	Enabled

continued

Table 5-1: RBSU Default Settings *continued*

Menu/Option	Default Setting
Virtual Install Disk	Disabled
Serial Number	
Product ID	
HW Prefetcher	Enabled
Adjacent Sector Prefetch	Enabled
ProLiant Power Governor	Full Performance Mode
Utility Language	English

Fan Redundancy

The Fan Redundancy Configuration option determines the behavior of the server if one or more of the cooling fans fail. This feature requires that the HP System Management driver be installed.

When the Fan Redundancy option is enabled and the HP System Management driver is installed, the server will not shut down if only one fan fails. If the system experiences multiple fan failures, the HP System Management Driver shuts down the operating system. Additionally, the System ROM will not allow the server to complete POST if any fan fails.

When the Fan Redundancy option is disabled, the server treats all fans as critical and shuts down the server if any fan fails.

ProLiant Power Governor

The ProLiant Power Governor utility, which is located under the Advanced Option menu in the ROM-Based Setup Utility (RBSU), provides users with multiple options for managing power usage of servers. The options supported are Full Performance, Power Savings Mode, and Dynamic Power Savings Mode.

Full Performance Mode

The default operation mode of the system is Full Performance Mode. In this mode, the system runs at its maximum performance state. This mode provides the maximum possible performance, but results in the maximum power consumption. This mode is useful for customers who want absolute maximum performance and whose environment is capable of providing sufficient power to the server to run at its maximum power mode.

Power Savings Mode

When Power Savings Mode is enabled, the system always runs in a lower mode of performance. When this mode is enabled, the processor is programmed to run at a lower frequency and with less voltage. When enabled, this feature guarantees lower maximum power consumption for the server. The Power Savings Mode is useful for customers whose environment is power constrained.

If the customer's power capabilities are increased in the future, the server can be reconfigured to run in a higher power and performance state. Enabling this feature may result in lower overall performance.

Dynamic Power Savings Mode

HP's Dynamic Power Savings Mode allows the system to adjust the processor's power and performance based on the processor's workload. When the processor is very busy, the processor will run at its maximum performance state. However, when the processor is not busy, it will run at a lower performance state. This allows decreasing the average power usage of the server. The system will vary the processor's performance, and therefore power usage, based on the system's needs.

This feature requires no OS-specific drivers or support. HP's ProLiant System BIOS provides all of the support necessary to support this feature.

Option ROM Configuration for Arrays Utility

The Option ROM Configuration for Arrays (ORCA) utility is a menu-driven utility that does not require a CD and can be started when the server blade is booting. This utility enables users to perform the following functions:

- Create, configure, and/or delete logical drives

- Specify RAID levels

- Assign online spares

- Set interrupts and the boot controller order

To run ORCA, press the **F8** key from the iLO Remote Console when the server blade is booting.

Network-Based PXE Deployment

For each server blade that you are deploying, the PXE server must be connected to the NIC designated for PXE. The server blade defaults PXE functions to NIC 1, but any of the four NICs can be designated for PXE in RBSU. For NIC connector locations on RJ-45 patch panels and interconnect switches, refer to the *HP ProLiant BL20p Generation 3 Server Blade Overview* card included with the server blade.

To deploy an operating system to multiple server blades, you can install a Preboot eXecution Environment (PXE) deployment server on a network.

PXE is a component of the Intel® Wired for Management (WfM) specification. The PXE model enables server blades to load and execute a network bootstrap program (NBP) from a PXE server and to execute a pre-configured image. The image can be an operating system image created by software utilities or a boot diskette image. This feature enables a user to configure a server blade and install an operating system over a network.

When a PXE-enabled client boots, it obtains an IP address from a dynamic host configuration protocol (DHCP) server. The client obtains the name of the NBP from the appropriate boot server. Then, the client uses trivial file transfer protocol (TFTP) to download the NBP from the boot server and executes the image.

Deployment Infrastructure

To establish a network-based PXE deployment infrastructure, you must provide the following software and minimum hardware:

- Client PC (administrative workstation)
  - — Intel Pentium® III or higher processor (700 MHz or greater recommended)
  - — 128 MB of RAM
  - — Microsoft Windows 2000 Professional or Microsoft Windows XP operating system
  - — Microsoft Internet Explorer 5.5 or above with 128-bit encryption
  - — Ethernet NIC with 10/100 RJ-45 connector
  - — TCP/IP networking and an IP address compatible with one of the following the iLO Diagnostic Port IP address or an assigned DHCP or static IP address
  - — CD-ROM drive and/or diskette drive
  - — Any of the following Java™ Runtime Environment versions:

    1.3.1_02

    1.3.1_07

    1.3.1_08

    1.4.1 for Windows users only

    1.4.2 for Linux users only

    Access the Java Runtime Environment versions at

    http://java.sun.com/products/archive/index.html

- DHCP server (IP address assignment)
  - — Pentium or Pentium II 200-MHz or faster processor
  - — 64 MB of RAM
  - — 64 MB of free hard drive space

- — 10 Mb/s network adapter
- PXE deployment server (storing boot images)
  - — Intel Pentium III or higher processor (500 MHz recommended)
  - — 256 MB of RAM
  - — 10 Mb/s network adapter
  - — CD-ROM drive
- NFS repository server (only required for Red Hat Linux deployment)
  - — Red Hat Linux 7.2 operating system installed
  - — Network connection
  - — CD-ROM drive
  - — NFS installed
  - — 1.5 GB of available disk space
- Windows repository server (only required for Windows deployment)
  - — Windows 2000 or Windows 2003 operating system installed
  - — Network connection
  - — CD-ROM drive
  - — 1.5 GB of available disk space
  - — TCP/IP networking and an IP address compatible with one of the following: the iLO Diagnostic Port IP address or an assigned DHCP or static IP address
  - — CD-ROM drive and/or diskette drive
  - — Any of the following Java Runtime Environment versions:

    1.3.1_02

    1.3.1_07

    1.3.1_08

    1.4.1 for Windows users only

1.4.2 for Linux users only

Access the Java Runtime Environment versions at

http://java.sun.com/products/archive/index.html

- Network server with an operating system installed

HP Systems Insight Manager

HP SIM provides comprehensive management of the ProLiant BL20p G3 server blades, maximizing system availability and optimizing IT staff efficiency. HP SIM allows systems administrators to quickly identify hardware failures, isolate and update systems running out-of-date system software, and easily access onboard management resources. In addition, HP SIM provides visualization support for the ProLiant BL20p G3 server blades that allows you to quickly view the configuration of the server blades within a server blade enclosure and speeds access to the HP Insight Management Agents, Version Control Agents, and iLO remote console.

Diagnostics Utility

Refer to the RBSU user guide and run the internal diagnostics before performing the following procedure.

To run Diagnostics Utility:

— Download the latest Diagnostics Utility from the HP website:

www.hp.com/servers/smartstart

— Follow the instructions and create a bootable diskette. For more information, refer to "Creating the Boot Diskette" in this chapter.

IMPORTANT: You can use the iLO Virtual Media applet to create the image file. Refer to the "Integrated Lights-Out Advanced Management" section in this chapter. If you use this method, omit step 3.

— Access the server blade through the iLO Remote Console. Refer to the *HP ProLiant BL p-Class System Hardware Configuration and Installation Poster.*

— Insert the virtual diskette.

— Use the iLO virtual power button to power the server blade off and then on, and to set the blade to boot from the diskette image you created in step 2.

The server blade boots from the downloaded image and runs the Diagnostics Utility.

Automatic Server Recovery-2

ASR-2 is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue-screen or kernel panic. A system fail-safe timer, the ASR-2 timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server blade.

ASR-2 increases server blade availability by restarting the server blade within 10 minutes after a system hang or shutdown. At the same time, the HP SIM console notifies you by sending a message to a designated pager number that ASR-2 has restarted the system. You can disable ASR-2 from the HP SIM console or RBSU.

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML time-stamps each event with 1-minute granularity.

Events listed in the IML are categorized as one of four event severity levels:

- Status — indicates that the message is informational only

- Repaired — indicates that corrective action was taken

- Caution — indicates a non-fatal error condition occurred

- Critical — indicates a component failure has occurred

Viewing the Log

You can view recorded events in the IML in several ways, including the following:

- From within the iLO Web pages

- From within the HP SIM

- From within the Survey Utility

- From within operating system specific IML viewers

    — For Windows 2000, Event Viewer, or HP IML Viewer

    — For Linux operating systems, HP IML Viewer Application

NOTE: You can only view the list from the **Recovery/Integrated Management Log** screen.

Viewing the Event List

To view the event list:

1. From HP SIM, select the appropriate server blade, then select **View Device Data**. The selected server blade appears with buttons around its perimeter.

2. Click **Recovery**.

3. Select **Integrated Management Log**.

4. If a failed component has been replaced, select the event from the list, then select **Mark Repaired**.

Printing the Event List

To print the event list:

1. From HP SIM, select the appropriate server blade. The selected server blade appears with buttons around its perimeter.

2. Click **Configuration**.

3. Click **Recovery**.

4. Click **Print**.

List of Events

The event list displays the affected components and the associated error messages. Though the same basic information displays, the format of the list may differ depending on whether you view it from within HP SIM or from within Survey Utility.

Table 5-2 identifies the event types (affected components) and associated event messages for server blades.

Table 5-2: Server Blade Event Messages

Event Type	Event Message
Machine Environment	
Fan failure	System Fan Failure (Fan *X*, Location)
Overheat condition	System Overheating (Zone *X*, Location)

continued

Table 5-2: Server Blade Event Messages *continued*

Event Type	Event Message
Main Memory	
Correctable error threshold exceeded	Corrected Memory Error threshold passed (Slot *X*, Memory Module *X*)
	Corrected Memory Error threshold passed (System Memory)
	Corrected Memory Error threshold passes (Memory Module unknown)
Processor	
Correctable error threshold exceeded	Processor Correctable Error threshold passed (Slot *X*, Socket *X*)
Uncorrectable error	Processor Uncorrectable internal error (Slot *X*, Socket *X*)
PCI Bus Error	PCI Bus Error (Slot *X*, Bus *X*, Device *X*, Function *X*)
Power Subsystem	
System configuration battery low	Real-Time Battery Clock Failing
Automatic Server Recovery	
System lockup	ASR Lockup Detected: *Cause*
Operating System	
Event Type	**Event Message**
System crash	Blue Screen Trap: *Cause* [NT®]
	Kernel Panic: *Cause* [Linux]
Automatic operating system shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure
	Automatic Operating System Shutdown Initiated Due to Overheat Condition
	Fatal Exception (Number *X*, *Cause*)

Configuration and Deployment Overview

Integrated Lights-Out Advanced (iLO Advanced) can be a helpful debugging tool in the configuration and deployment progress. HP recommends using iLO Advanced to follow the process. Refer to the "Integrated Lights-Out Advanced Management" section in this chapter for connection instructions.

It is useful to set up and configure a server blade iLO as an initial step to deployment. Several ways exist to assign an IP address to iLO:

- Static IP bay configuration

- DHCP

- Manual static IP address assignment

Static IP Bay Configuration

Static IP bay configuration, implemented using the new Static IP Bay Settings on the BL p-Class tab, eases the initial deployment of an entire enclosure, or the subsequent deployment of blades within an existing enclosure. While the preferred method for assigning IP addresses to each server blade iLO is through DHCP and DDNS, these protocols are not always available on non-production networks.

Static IP bay configuration automates the first step of BL p-Class blade deployment by enabling the iLO management processor in each blade slot to obtain a predefined IP address without relying on DHCP. iLO is immediately accessible for server deployment using Virtual Media and other remote administration functions.

Static IP bay configuration uses the Static IP Bay Configuration addressing method which allows you to assign IP addresses to each iLO based on slot location in the respective server enclosure. By providing a set of IP addresses in the enclosure, you gain the advantages of a static IP bay configuration, without requiring each individual iLO to be configured locally.

Using the iLO static IP bay configuration will:

- Help avoid the costs of a DHCP infrastructure to support the blade environment.

- Provide easier setup with automatic iLO address generation for all or a few selected bays.

iLO Hardware and Firmware Requirements

- An updated EEPROM on the power back plane to support the multi-record format

- A server blade management module must be present and functioning properly

- The iLO IPMI stack must be initialized

- The iLO should be initialized and functioning

- The most current version of iLO firmware to support this feature

User requirements

- Users must have the Configure iLO Settings privilege

- The network must function properly

Configuring a ProLiant BL p-Class Blade Enclosure

To configure a BL p-Class blade enclosure using static IP bay addressing, you must:

1. Install a server blade in bay 1 of the BL p-Class enclosure. The server blade does not need to be configured or have an operating system installed. The server blade must be configured before installing any additional blades in the enclosure.

2. Connect a client device to the front-panel iLO port of the blade using the local I/O cable. The local I/O cable connects to the I/O port on the front of the server blade. This will enable the static 192.168.1.1 for the iLO web interface.

3. Configure the enclosure setting. Using the iLO web interface, select the **BL p-Class** tab to access the Enclosure Static IP Settings. The BL p-Class tab provides a user interface for configuring the enclosure-level static IP addresses.

HP recommends selecting a reasonable starting IP address, with the last digit(s) of the address corresponding to the bay number of each blade (example: 192.168.100.1 through 192.168.100.16), the user can build an easy-to-remember numbering system.

4. Reset Bay #1, if necessary. The blade in Bay #1 must only be reset if you intend the blade to use a Static IP Bay Configuration address by marking the feature enable mask for Bay #1. Before resetting the blade, you must browse to the Network Settings page, select **Enable Static IP Settings** and press **Apply.** This will force the blade to reboot and use the newly assigned enclosure static IP.

If multiple enclosures are deployed at the same time, the process can be repeated easily by moving a single blade to Bay #1 of each enclosure to perform the configuration.

Configuring Static IP Bay Settings

Static IP bay settings, available on the BL p-Class tab, allow you to configure and deploy the blade server.

The Enable Static IP Bay Configuration Settings checkbox, available on the Network Settings tab (not shown), allows you to enable or disable Static IP Bay Configuration. The new Enable Static IP Bay Configuration Settings option, is only available on blade servers. When Static IP Bay Configuration is enabled, all fields except iLO Subsystem Name are disabled. Only Static IP Bay Configuration or DHCP can be enabled at one time. Disabling both Static IP Bay Configuration and DHCP will signal iLO to use a user defined IP address. The Enable Static IP Bay Configuration Settings option will remain disabled if the infrastructure does not support Static IP Bay Configuration. Refer to Figure 5-1 for the Static IP Bay Configuration screen.

Figure 5-1: Static IP Bay Configuration screen

Standard Configuration Parameters

Beginning IP Address (Bay 1)—Assigns the starting IP address. All IP addresses must be valid addresses.

Ending IP Address (Bay 16)—Assigns the ending IP address. All IP addresses must be valid addresses.

Subnet Mask—Assigns the subnet mask for the default gateway. This field may be filled in if either Static IP Bay Configuration or DHCP is enabled. The entire IP address range must conform to the subnet mask.

Gateway IP Address—Assigns the IP address of the network router that connects the Remote Insight subnet to another subnet where the management PC resides. This field may be filled in if either Static IP Bay Configuration or DHCP is enabled.

Advanced Configuration Parameters

Domain Name—Allows you to assign the name of the domain in which the iLO will participate.

Primary DNS Server—Assigns a unique DNS server IP address on your network.

Secondary DNS Server—Assigns a unique DNS server IP address on your network.

Tertiary DNS Server—Assigns a unique DNS server IP address on your network.

Primary WINS Server—Assigns a unique WINS server IP address on your network.

Secondary WINS Server—Assigns a unique WINS server IP address on your network.

Static Route #1, #2, and #3 (destination gateway)—Use one of these parameters to assign the appropriate static route destination and gateway IP address on your network. The default IP values are 0.0.0.0 and 0.0.0.0, where the first IP address corresponds to the destination IP, and the second IP address corresponds to the gateway IP.

Enable iLO IP Address Assignment

To configure the BL p-Class server blades for IP address assignment:

- Check bays (1 through 16) to select the appropriate BL p-Class server blades.

- Click **Enable All** to select all server blades.

- Click **Clear All** to clear all previous selections.

Click **Apply** after making the selection.

Moving the Blade or Downgrading the iLO Firmware

If it becomes necessary to move the blade to a new enclosure, or change the iLO firmware, the following can occur:

- If the rack does not support Static IP Bay Configuration and Static IP Bay Configuration is enabled, the blade will revert to DHCP addressing automatically.

- If the blade is downgraded with Static IP Bay Configuration enabled, the IP address setting will become static. If you want to use DHCP, you must re-enable DHCP through the iLO web interface or use an XML script.

Remote Insight Command Language

Several new XML commands have been added to the Remote Insight Command Language (RIBCL) structure to support reading and writing of Static IP Bay Configuration in scripting. The new RIBCL commands must be scripted within a RACK_INFO command block. The new attributes are:

- **MOD_ISIP_SETTINGS** modifies the Static IP Bay Configuration settings. This command is only valid inside a RACK_INFO block. The logged-in user must have the configure iLO privilege. This attribute must appear inside the RACK_INFO command block with MODE = "write."

- **SLOT_ENABLE MASK** enables the use of Static IP Bay Configuration addressing. The attribute MASK is a 16-bit number. Each bit represents a slot in the enclosure. If the bit is set, that particular slot will be assigned to use the Static IP Bay Configuration settings. The least significant bit (LSB) represents slot 1. For example, the MASK="0x0001" will only allow slot 1 to use Static IP Bay Configuration. This number can be either a hexadecimal number or a decimal number. This command must appear inside the MOD_ISIP_SETTINGS block.

- **ISIP_ENABLE** is used to enable or disable the use of Static IP Bay Configuration. This attribute must appear inside the MOD_NETWORK_SETTINGS command block. The possible values are "Y" or "N." It is case insensitive. This attribute is only applicable on blade servers.

- **GET_ISIP_SETTINGS** requests the respective iLO's Static IP Bay Configuration settings. This attribute must appear inside the RACK_INFO command block. The RACK_INFO command block may be set to read or write.

RIBCL Examples

Getting Static IP Bay Configuration Settings

```
<RIBCL VERSION="2.0">
<LOGIN USER_LOGIN="Admin" PASSWORD="password">
<RACK_INFO MODE="write">

   <GET_ISIP_SETTINGS/ >

</RACK_INFO>
</LOGIN>
</RIBCL>
```

Modifying Static IP Bay Configuration Settings

```
<RIBCL VERSION="2.0">
<LOGIN USER_LOGIN="Admin" PASSWORD="password">   <RACK_INFO
MODE="write">

   <MOD_ISIP_SETTINGS>

         <SLOT_ENABLE MASK="0x3FE"/>
         <IP_ADDRESS VALUE="16.100.222.111"/>
         <SUBNET_MASK VALUE="255.255.252.0"/>
         <GATEWAY_IP_ADDRESS VALUE="16.100.222.1"/>
         <DOMAIN_NAME VALUE="sum.won.here.now"/>
         <PRIM_DNS_SERVER VALUE="16.11.1.111"/>
```

```
                          <SEC_DNS_SERVER VALUE=""/>
                          <TER_DNS_SERVER VALUE=""/>
                          <PRIM_WINS_SERVER VALUE="16.22.2.222"/>
                          <SEC_WINS_SERVER VALUE=""/>
                          <STATIC_ROUTE_1 DEST="16.33.3.33"
                          GATEWAY="16.100.11.11"/>
                          <STATIC_ROUTE_2 DEST="" GATEWAY=""/>
                          <STATIC_ROUTE_3 DEST="" GATEWAY=""/>

                  </MOD_ISIP_SETTINGS>

          </RACK_INFO>
          </LOGIN>
          </RIBCL>
```

Modify Network Settings to enable Static IP Bay Configuration

```
          <RIBCL VERSION="2.0">
          <LOGIN USER_LOGIN="Admin" PASSWORD="password">
          <RIB_INFO MODE="write">

              <MOD_NETWORK_SETTINGS>

                      <ISIP_ENABLE VALUE="Yes"/>

              </MOD_NETWORK_SETTINGS>

          </RIB_INFO>
          </LOGIN>
          </RIBCL>
```

Refer to the *HP Integrated Lights-Out User Guide* for information on DHCP and the manual setting of IP addresses.

Deployment Methods

Four primary deployment methods are supported:

IMPORTANT: To deploy a server blade without the RDP, you must create a bootable diskette or image of a bootable diskette.

- PXE Deployment
- CD-ROM Deployment
- Diskette image deployment
- Boot from SAN

PXE Deployment

PXE enables server blades to load an image over the network from a PXE server, then execute it in memory. The first NIC on the server blade is the default PXE boot NIC, but any of the other NC series NICs can be configured to boot PXE. Refer to "Network-Based PXE Deployment" in this chapter for more information.

NOTE: Actual NIC numeration depends on factors, including the operating system installed on the server.

HP recommends using one of the following methods for PXE deployment:

- HP ProLiant Essentials RDP
- SmartStart Scripting Toolkit

HP ProLiant Essentials Rapid Deployment Pack

RDP is the recommended method for automatically deploying the server blade with little user intervention.

The HP ProLiant Essentials RDP software is the preferred method for rapid, high-volume server blade deployments. The RDP software integrates two powerful products: Altiris eXpress Deployment Solution and the ProLiant Integration Module.

The Altiris eXpress Deployment Server Console has an intuitive graphical user interface that provides simplified drag-and-drop server deployment using either imaging or scripting. The console also has advanced features for blade servers. The user can view blade servers in a physical tree view according to their Rack\Enclosure\Bay settings. The Deployment Server can detect when a blade is ripped out and replaced with a new blade. The user can configure the Deployment Server to automatically replay all deployment jobs on the new blade.

If you purchased the RDP with the blade enclosure, follow the instructions on the Quick Start Guide, included in the kit, to register and install the software.

For product information and the latest RDP documentation, go to

www.hp.com/servers/rdp

SmartStart Scripting Toolkit

The HP SmartStart Scripting Toolkit radically simplifies high-volume server deployment, enabling thousands of servers to be deployed quickly and easily. The SmartStart Scripting Toolkit consists of a set of modular utilities that are used to create a set of configuration data files, which are combined using a script or batch file to provide an automated installation process.

The basic steps necessary to use the SmartStart Scripting Toolkit are:

1. Generate the server profile from a previously configured server.

2. Create a script (batch) file that reads in server configuration files to configure the server hardware and install the server operating system.

3. Build the server configuration diskette that initiates the automated deployment process.

For details, download the latest version of the SmartStart Scripting Toolkit from www.hp.com/servers/sstoolkit and refer to the *SmartStart Scripting Toolkit User Guide*.

CD-ROM Deployment

CD-ROM Deployment involves using a bootable CD that executes script to configure the hardware and install the operating system. After the operating system is configured, the server blade can access the network to locate the scripts and files necessary for deployment.

The server blade should be connected to a network before beginning the deployment process. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)

  This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).

- Through an existing network (out of the rack, with the diagnostic station)

  This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

Other methods are available for connecting to the ProLiant BL20p G3 server blade, but they do not provide the network accessibility required to deploy the server. Refer to "Integrated Lights-Out Advanced Management" in this chapter for information about these additional methods.

NOTE: For more information about these hardware and cabling configurations, refer to the *HP ProLiant BL p-Class System Hardware Configuration and Installation Poster* and the documentation that ships with the diagnostic station.

Server blades have two mechanisms for using the CD-ROM:

- iLO Virtual CD-ROM
- USB CD-ROM

iLO Virtual CD-ROM

To perform a boot CD deployment:

1. Do one of the following:

   — Insert the boot CD into the client PC from which you are running the iLO Remote Console.

   — Use iLO Advanced to create an image file of the boot CD.

   — Copy the image of the boot CD to a location on the network or the client PC hard drive.

2. Remotely access the server blade through iLO Advanced. Refer to "Integrated Lights-Out Advanced Management" in this chapter.

3. Click the **Virtual Devices** tab.

4. Select **Virtual Media**.

5. Use the Virtual Media applet to select the local CD or image file and connect the Virtual CD to the server blade.

6. Use the iLO Virtual Power Button feature to reboot the server blade.

7. After the server blade boots, follow the normal network installation procedure for an operating system.

USB CD-ROM

SmartStart simplifies the deployment process and facilitates loading the operating system. However, SmartStart does not prevent you from loading the operating system and drivers manually. For more information on SmartStart, refer to the HP website:

www.hp.com/servers/smartstart

To perform a boot CD deployment:

1. Connect a USB CD-ROM drive to the server blade using the local I/O cable.

2. Insert the boot CD into the CD-ROM.

3. Reboot the server blade.

4. After the server blade boots, follow the normal installation procedure for an operating system.

Diskette Image Deployment

Diskette Image Deployment involves creating a DOS-based network-enabled boot diskette that will execute a script that configures the hardware and installs the operating system. The diskette gets the server blade on the network where it can access the scripts and files necessary for deployment. This implies a deployment infrastructure that may include an administrator workstation, PXE server, Microsoft Windows file share, or a Linux file share.

The server blade must be connected to a network before beginning the deployment process. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)

  This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).

- Through an existing network (out of the rack, with the diagnostic station)

  This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

Other methods are available for connecting to the ProLiant BL20p G3 server blade, but they do not provide the network accessibility required to deploy the server. Refer to "Integrated Lights-Out Advanced Management" in this chapter for information about these additional methods.

NOTE: For more information about these hardware and cabling configurations, refer to the *HP ProLiant BL p-Class System Hardware Configuration and Installation Poster* and the documentation that ships with the diagnostic station.

Creating the Boot Diskette

The SmartStart Scripting Toolkit provides the tools and information for creating a diskette that will configure the hardware and install the operating system.

For details, download the latest version of the SmartStart Scripting Toolkit from www.hp.com/servers/sstoolkit and refer to the *SmartStart Scripting Toolkit User Guide*.

It is also possible to configure the hardware manually using RBSU through the iLO Advanced remote console. With this method, the diskette would be more generic and would integrate into an existing network OS installation process. Refer to the "Integrated Lights-Out Advanced Management" section in this chapter.

For the most current information about operating system support on server blades, refer to the operating system support matrix, available on the HP website:

www.hp.com/products/servers/platforms

then navigate to the OS support for ProLiant BL p-Class server blades.

IMPORTANT: The ProLiant BL20p G3 server blade has the ability to connect to a SAN using the optional FC adapter. You can preconfigure the SAN HBA driver Smart Components in the ProLiant Support Pack. Refer to the *HP ProLiant Support Pack User Guide* or "SAN Configuration Overview" in this chapter for more information.

Using the Boot Diskette

Server blades have two mechanisms for using the diskette: iLO Virtual Floppy and PXE.

iLO Virtual Floppy Deployment

To perform a boot diskette deployment:

1. Do one of the following:

   — Insert the boot diskette into the client PC from which you are running the iLO Remote Console.

   — Use iLO Advanced to create an image file of the boot diskette.

   — Copy the image of the boot diskette to a location on the network or the client PC hard drive.

2. Remotely access the server blade through iLO Advanced. Refer to "Integrated Lights-Out Advanced Management" in this chapter.

3. Click the **Virtual Devices** tab.

4. Select **Virtual Media**.

5. Use the Virtual Media applet to select the local diskette or image file and connect the Virtual Disk to the server blade.

6. Use the iLO Virtual Power Button feature to reboot the server blade.

7. After the server blade boots, follow the normal network installation procedure for an operating system.

SAN Configuration Overview

The ProLiant BL20p G3 server blade delivers FC support for SAN implementations and clustering capabilities. The ProLiant BL20p G3 server blade uses an optional FC adapter for redundant SAN connectivity and is optimized for HP StorageWorks. In addition, the server blade is also compatible with certain third-party SAN products. Refer to the *HP ProLiant BL20p Generation 3 Dual Port Fibre Channel Adapter Installation Instructions* for installation requirements and instructions.

For optimal SAN connectivity, verify that:

- The HP ProLiant BL20p G3 server blade has the FC adapter installed, and that it is correctly installed in the server blade enclosure. Refer to the *HP ProLiant BL20p Generation 3 Dual Port Fibre Channel Adapter Installation Instructions*

- A Fibre-capable interconnect is installed in the enclosure. Refer to the documentation that shipped with the interconnect option

- The enclosure management module firmware is up-to-date. Refer to the ProLiant BL p-Class support site on www.hp.com

- The server blade is properly cabled to a supported SAN

- SAN storage drivers are loaded. Refer to supporting white papers and to www.hp.com/servers/rdp.

For SAN configuration information for the server blade, consult the *SAN Design Reference Guide* located on the HP website:

h18006.www1.hp.com/storage/saninfrastructure.html

6

Connecting Local I/O Devices

Use the local I/O cable to perform some server blade configuration and diagnostic procedures.

Connecting to a Server Blade through iLO

To connect to iLO using the local I/O cable, you must have the following:

- A client PC with a 10/100 Ethernet RJ-45 connector

- A network cable with RJ-45 connectors

To connect directly to iLO:

IMPORTANT: Do not connect the local I/O cable to a hub. All server blades have the same IP address through the I/O port. Multiples on a hub make the server blades indistinguishable on the network. Refer to "Integrated Lights-Out Advanced Management" in Chapter 5, "Server Blade Configuration and Utilities" for the default server blade IP address.

1. Connect one end of the RJ-45 network cable to the local I/O cable (1).

2. Connect the other end of the network cable to the 10/100 Ethernet RJ-45 connector on the client PC (2).
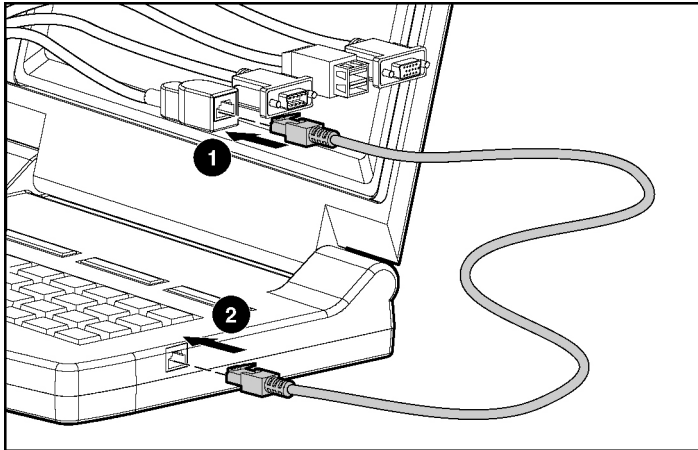
Figure 6-1: Connecting an RJ-45 network cable

IMPORTANT: Before removing the local I/O cable, completely log out of the current iLO session. Do not remove the local I/O cable when the Unit Identification (UID) LED is blinking.

3. Connect the local I/O cable to the I/O port on the server blade.

⚠ **CAUTION:** Disconnect the local I/O cable from the port when not in use. The port and connector do not provide a permanent connection. Rear iLO connector performance degrades when the local I/O cable is in use, even when the iLO connector on the cable is not in use.
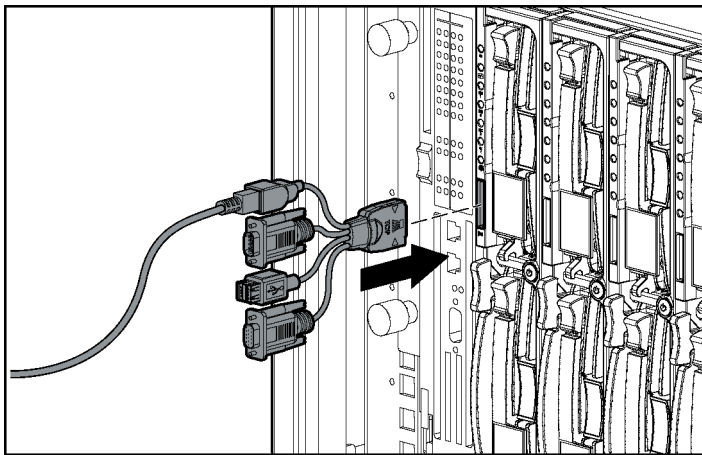
Figure 6-2: Connecting the local I/O cable to a server blade

⚠ **CAUTION:** On the local I/O cable, the locking buttons are located on the sides of the server blade connector.

Always be sure to squeeze the locking buttons on the server blade connector before disconnecting the local I/O cable from the I/O port. Failure to do so can result in damage to the equipment.

Connecting Directly to a Server Blade using Video and USB Devices

To connect directly to the server blade, use the local I/O cable and any of the following USB devices:

- Monitor
- USB Hub
- USB Keyboard
- USB Mouse
- USB CD-ROM
- USB Floppy

The devices can be connected to the local I/O cable in various configurations. Two of the possible configurations are detailed in the following sections.

Directly Accessing a Configured Server Blade with Local Keyboard, Video, and Mouse

⚠ **CAUTION:** Disconnect the local I/O cable from the port when not in use. The port and connector do not provide a permanent connection. Rear iLO connector performance degrades when the local I/O cable is in use, even when the iLO connector on the cable is not in use.

NOTE: For this setup, a hub is not necessary to connect directly to the blade. If you need additional connections, use the second setup.

1. Connect the video connector to a monitor (1).

2. Connect a USB mouse to the USB connector (2).

3. Connect a USB keyboard to the USB connector (3).

4. Connect the local I/O cable to the server blade (4).
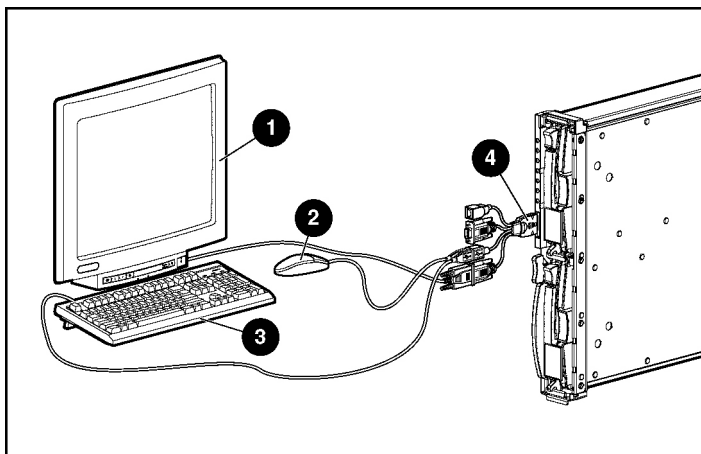
Figure 6-3: Directly accessing a server blade with keyboard, video, and mouse

Directly Accessing a Server Blade with Local Media Devices

Use the following setup to configure a server blade or load software updates or patches using a CD-ROM such as the SmartStart CD or a floppy drive:

⚠ **CAUTION:** Disconnect the local I/O cable from the port when not in use. The port and connector do not provide a permanent connection. Rear iLO connector performance degrades when the local I/O cable is in use, even when the iLO connector on the cable is not in use.

1. Connect the local I/O cable to the server blade (1).

2. Connect a monitor to the video connector (2).

3. Connect a USB hub to a USB connector (3).

4. Connect the following to the USB hub:

   a. USB CD-ROM (4) and/or a USB diskette drive

   b. USB keyboard (5)

   c. USB mouse (6)

NOTE: HP recommends the use of a USB hub when connecting a USB floppy and/or USB CD-ROM drive to the server blade. This provides more available connections.
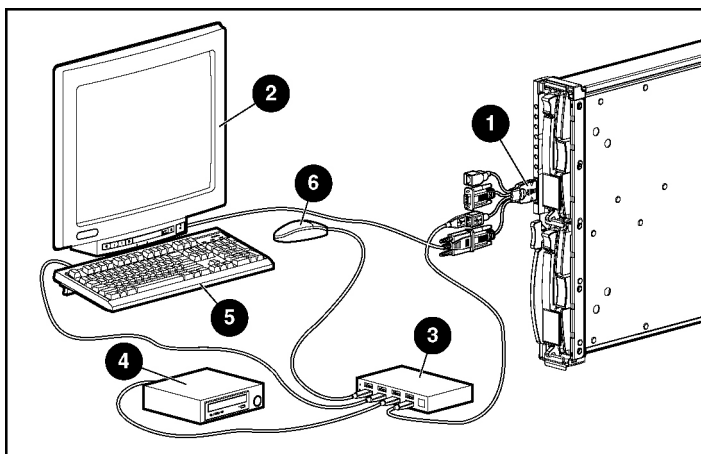
Figure 6-4: Directly connecting local media devices to the server blade using a USB hub

A

Server Blade Troubleshooting

Server Blade Error Messages

Use POST error messages to assist in troubleshooting and performing basic diagnostic functions in the server blade.

POST error messages are displayed in the following locations:

- Integrated Management Log (IML)

- iLO POST log

- iLO Remote Console

For a complete listing of error messages and other troubleshooting information, refer to the *HP ProLiant Servers Troubleshooting Guide* provided on the Documentation CD or www.hp.com/support.

For information on LEDs and switches specific to the server blade, refer to Chapter 1, "Server Blade Component Identification."

For information about general troubleshooting techniques, diagnostic tools, error messages, and preventative maintenance, refer to the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD.

When the Server Blade Does Not Start

This section provides systematic instructions on what to try and where to go for help for the most common problems encountered during initial POST. The server blade must first complete this test each time you power up, before it can load the operating system and start running software applications.

IMPORTANT: Always be sure that you have adequate system power applied to all the rack components before troubleshooting the server blade. You may need to add more hot-plug power supplies if you are installing additional server blades. If you have a power problem, refer to the *HP ProLiant BL p-Class System Setup and Installation Guide* and the *HP ProLiant BL p-Class System Overview and Planning* white paper.

If the server blade does not start:

1. Be sure that the server blade is fully seated in the server blade enclosure.

2. Verify that power is applied to the server blade enclosure.

3. Be sure that power is applied to the server blade:

   a. Check the status using the power on/standby LED. For the location and explanation of the power on/standby LED, refer to the "Server Blade Front Panel" section in Chapter 1, "Server Blade Component Identification."

   b. Check the server blade management modules and power management modules for proper cabling and power configuration switch settings.

   c. The server blade is configured to power up upon insertion. However, if you changed that setting, be sure that the Power On/Standby button was pressed firmly.

   NOTE: A long press, 5 or more seconds, initiates a power-up override. The system is forced to power up the server blade without detecting available power.

4. If the system does not complete POST or start loading an operating system:

   a. Use the iLO remote console, the video connection provided through the local I/O cable connectors, or the iLO system status page to identify POST messages. Refer to the *HP Integrated Lights-Out User Guide*.

   b. Refer to the *HP ProLiant Servers Troubleshooting Guide*.

5. Be sure the server blade is not rebooting repeatedly:

   a. Be sure that the system is not rebooting due to a problem that initiates an ASR-2 reboot.

      ASR-2 is defaulted to restart the server blade automatically, loading the operating system. If a critical error occurs, ASR-2 logs the error in the IML and restarts the server blade.

      For more information, refer to the *HP ProLiant Servers Troubleshooting Guide*.

   b. Use the iLO remote console or the video connection provided through the local I/O cable connectors to identify a possible thermal event.

6. Restart the server blade. If the server blade does not restart, proceed to the "Server Blade Diagnostic Steps" section in this appendix.

7. Check the server blade for the following normal power-up sequence to be sure that the system meets the minimal hardware requirements and is powered up during normal operations:

   a. The power on/standby LED changes from standby (amber) to on (solid green).

   b. The fans start up.

   c. The health LED flashes during the POST process; it changes to solid green if POST is successful.

8. View the iLO remote console or the video connection provided through the local I/O cable connectors for the following boot messages to be sure the system meets the minimal hardware requirements and is powered up during normal operations:

   a. ProLiant logo

   b. Memory test

   c. ROM information

   d. Copyright information

   e. Processor initialization

f. iLO initialization

g. Array controller initialization

h. PXE initialization

9. The operating system loads to complete the boot process.

If the server blade completes POST and attempts to load the operating system, refer to the "Problems After Initial Boot" section in this appendix.

Server Blade Diagnostic Steps

If the server blade does not power up, or powers up but does not complete POST, answer the questions in Table A-1 to determine appropriate actions based on the symptoms observed. According to the answers you give, you are directed to the appropriate table that immediately follows.

Table A-1: Diagnostic Steps

Question	Action
Question 1: Is the server blade power on/standby LED illuminated?	If yes, continue to question 2.
	If no, refer to Table A-2.
Question 2: Is the server blade power on/standby LED green?	If yes, continue to question 3.
	If no, refer to Table A-3.
Question 3: Is the server blade health LED solid green?	If yes, continue to question 4.
	If no, refer to Table A-4.
Question 4: Is the iLO remote console displaying error information?	If yes, use the POST messages for further diagnosis. Refer to Table A-5 for details.
	If no, refer to Table A-5.

Table A-2: Is the Server Blade Power on/standby LED Illuminated?

Answer	Possible Reasons	Possible Solutions
No	A broken connection exists between the server blade enclosure and server blade. The power enclosure is not powered on. The system may have experienced a short. Either or both of the power modules may be failed or not fully seated.	Do the following: 1. Verify that power is applied to the infrastructure. 2. Remove the server blade from the server blade enclosure. 3. Check the connectors on the rear of the server blade and on the interior of the server blade enclosure for damage. If the power on/standby LED is still not illuminated, do one of the following: • Use the optional diagnostic station to power the server blade and use the iLO remote console to continue your diagnosis. Refer to "Power Converter Module LED" in this appendix. • Move the server blade into a different slot to determine if the server blade or the server blade enclosure is the source of the problem. • Contact an authorized service provider for replacement parts and service.
Yes		If the power on/standby LED is illuminated, refer to Table A-3.

Note: For LED locations and functions, refer to Chapter 1, "Server Blade Component Identification." For cabling configurations, refer to the cabling and powering up section in the *HP ProLiant BL p-Class System Setup and Installation Guide*.

Table A-3: Is the Server Blade Power on/standby LED Green?

Answer	Possible Reasons	Possible Solutions
No, it is amber	Power On/Standby button has not been pressed firmly.	1. With the system powered down, remove the access panel.
	The standard NIC mezzanine card or Smart Array 6i controller is unseated.	2. Be sure that the proper connections exist among the power converter module, system board, SCSI backplane, and power button/LED board.
	Management modules are not properly cabled.	
	A broken connection exists between the following:	3. Reseat the standard NIC mezzanine card or Smart Array 6i controller.
	• Power converter module and system board	4. Reinstall the access panel.
	• System board and SCSI backplane	5. Reinstall the server blade.
	• SCSI backplane and power button/LED board	Firmly press the Power On/Standby button. A long press (5 or more seconds) initiates a power-up override. The system is forced to power up the server blade without detecting available power.
	The power converter module, system board, SCSI backplane, and/or power button/LED board may need to be replaced.	Verify proper management module cabling.
		Restart the server blade through the iLO Virtual Power button feature.
		If the power on/standby LED is still not green, and if the server blade health LED is amber or red, refer to Table A-4.
		Use the optional diagnostic station to power the server blade and use the iLO remote console to continue your diagnosis. Refer to "Power Converter Module LED" in this appendix.
Yes		If the power on/standby LED is green, refer to Table A-4.

Note: For LED locations and functions, refer to Chapter 1, "Server Blade Component Identification."

Table A-4: Is the Server Blade Health LED Solid Green?

Answer	Possible Reasons	Possible Solutions
No, it is amber.	A processor is in pre-failure condition.	Do the following:
	A DIMM is in pre-failure condition.	1. Remove the server blade from the server blade enclosure.
	One memory bank is valid, but another bank is missing a DIMM.	2. With the system powered down, remove the access panel.
	One memory bank is valid, but another bank has mismatched DIMMs installed.	3. Visually inspect the system for damage.
	One memory bank is valid, but another bank has an unsupported DIMM type installed.	4. Reseat or replace processors and/or DIMMs.
		5. Be sure that the proper connections exist among the power converter module, system board, SCSI backplane, and power button/LED board.
		6. Verify that DIMMs are installed in pairs.
		7. Reinstall the access panel.
		8. Reinstall and power up the server blade.

continued

Table A-4: Is the Server Blade Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
		If the health LED is still not solid green, do one of the following:
		• Use the optional diagnostic station to power the server blade and use the iLO remote console to continue the diagnosis. Refer to "Power Converter Module LED" in this appendix.
		• Use the optional diagnostic station to power the server blade and use the local I/O cable connectors to continue the diagnosis. Refer to "Power Converter Module LED" in this appendix.
		Contact an authorized service provider for replacement parts and service.

continued

Table A-4: Is the Server Blade Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
No, it is flashing green.	The server blade is still in POST. If the flashing continues after 1 minute, the following conditions may apply: • Nonvolatile RAM (NVRAM) may be corrupted. • The system ROM may be corrupted. • Both the system ROM and redundant ROM may be corrupted.	Wait for the server blade to complete POST. Clear the system configuration. Refer to the "Clearing the System Configuration" section in this appendix. Switch to the redundant ROM. Refer to the "Accessing the Redundant ROM" section in this appendix. If the health LED is still not solid green, do one of the following: • Use the optional diagnostic station to power the server blade and use the iLO remote console to continue the diagnosis. • Use the optional diagnostic station to power the server blade and use the local I/O cable connectors to continue the diagnosis. • Use the iLO system status page to help determine the problem. • Contact an authorized service provider for replacement parts and service.

continued

Table A-4: Is the Server Blade Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
No, it is red	A processor has failed. Processor 1 is not installed. A processor is an unsupported type. Processors are mismatched (speed and/or type). A PPM has failed. A DIMM has experienced a multibit error. No valid memory is available in the system. Populated banks have mismatched DIMMs. No valid memory is available in the system. Populated banks have missing DIMMs. No valid memory is available in the system. Populated banks have unsupported DIMM types. One or both fans have failed. An overtemperature condition has occurred.	Do the following: 1. Remove the server blade from the server blade enclosure. 2. With the system powered down, remove the access panel. 3. Visually inspect the system for damage. 4. Add or replace processors, DIMMs, and/or the fans. 5. Verify the proper connections among the power converter module, system board, SCSI backplane, and the power button/LED board. 6. Reinstall and power up the server blade. If the health LED is still not solid green, do one of the following: • Use the optional diagnostic station to power the server blade and use the iLO remote console to continue the diagnosis. • Use the optional diagnostic station to power the server blade and use the local I/O cable connectors to continue the diagnosis. • Use the iLO system status page to help determine the problem. • Contact an authorized service provider for replacement parts and service.
Yes		If the health LED is green, refer to Table A-5.

Note: For LED locations and functions, refer to Chapter 1, "Server Blade Component Identification." For cabling configurations, refer to the cabling and powering up section in the *HP ProLiant BL p-Class System Setup and Installation Guide*.

Table A-5: Is the iLO Remote Console Displaying Error Information?

Answer	Solution
No	An iLO problem exists. Refer to the *HP Integrated Lights-Out User Guide* that ships with the server blade.
Yes	Error and event logs are available for diagnosis. Determine the next action by observing POST progress and error messages. Use the iLO system status page or use the local I/O cable connectors to help determine the problem. Refer to the *HP ProLiant Servers Troubleshooting Guide* for a complete description of POST error messages.

Power Converter Module LED

The power converter module LED (CR25) can be located through the rear of the server blade when the server blade is laying on a flat surface and receiving power from a diagnostic station.

⚠ **WARNING: To reduce the risk of shock or injury from high-current electrical energy, do not remove the server blade access panel while the server blade is connected to the diagnostic station.**

Powering the server blade with the access cover removed is a service operation and must only be performed by trained service personnel.
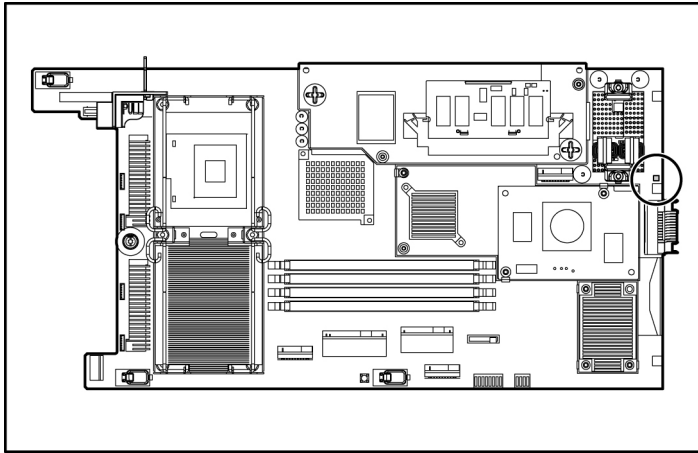
Figure A-1: Power converter module LED location

Table A-6: Power Converter Module Troubleshooting Table

Status	Description
On	The power is good and the power converter modules are working.
Off	The power converter modules are not fully seated and must be reseated.
	or
	The power converter modules have failed and must be replaced.

System Maintenance Switch Procedures

When you perform troubleshooting steps, this guide may instruct you to perform the following procedures:

- Clear the system configuration.

- Access the redundant ROM.

IMPORTANT: Do not perform these procedures until directed to do so by the troubleshooting tables in this appendix.

To complete these procedures, you must change physical settings on the system maintenance switch (SW2). For switch locations and positions, refer to Chapter 1, "Server Blade Component Identification."

Clearing the System Configuration

To clear the system configuration:

1. Power down the server blade using one of the following procedures:

    — Press the Power On/Standby button on the front of the server blade.

    — Use the virtual power button feature in the iLO remote console.

2. Disconnect the server blade from all power sources using one of the following procedures:

    — Remove the server blade from the server blade enclosure and set it on a flat, level surface.

    — Disconnect the server blade from the diagnostic station.

3. Remove the access panel. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

4. Change position 6 of SW2 to on.

5. Install the access panel. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

6. Connect the server blade to system power using one of the following procedures:

   — Install the server blade in the server blade enclosure.

   — Connect the server blade to the diagnostic station.

7. Power up the server blade using one of the following procedures:

   — Press the Power On/Standby button on the front of the server blade.

   — Use the virtual power button feature in the iLO remote console.

8. Wait for the POST message that prompts you to change the switch setting:

   ```
   Maintenance switch detected in the "On" position.
   Power off the server and turn switch to the "Off" position.
   ```

9. Repeat steps 1 through 3.

10. Change position 6 of SW2 to off.

11. Repeat steps 5 through 7.

   IMPORTANT: When the server blade boots after NVRAM is cleared, a delay of up to 2 minutes is normal. During this delay, the system appears non-functional. Do not attempt any procedures during the delay.

Accessing the Redundant ROM

If the system ROM is corrupted, you can set the system to use the backup version or redundant ROM.

To use the redundant ROM:

1. Power down the server blade using one of the following procedures:

    — Press the Power On/Standby button on the front of the server blade.

    — Use the virtual power button feature in the iLO remote console.

2. Disconnect the server blade from all power sources using one of the following procedures:

    — Remove the server blade from the server blade enclosure and set it on a flat, level surface.

    — Disconnect the server blade from the diagnostic station.

3. Remove the access panel. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

4. Change positions 1, 5, and 6 of SW2 to on.

5. Install the access panel. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

6. Connect the server blade to system power using one of the following procedures:

    — Install the server blade in the server blade enclosure.

    — Connect the server blade to the diagnostic station.

7. Power up the server blade using one of the following procedures:

    — Press the Power On/Standby button on the front of the server blade.

    — Use the virtual power button feature in the iLO remote console.

    As soon as the server blade powers up, it emits two beeps.

8. Repeat steps 1 through 3.

9. Change positions 1, 5, and 6 of SW2 to off.

10. Repeat steps 5 through 7.

If both the current and backup versions of the ROM are corrupt, you must return the system board for a service replacement. Refer to the *HP ProLiant BL p-Class System Maintenance and Service Guide* and contact an authorized reseller.

Problems After Initial Boot

Once the server blade has passed POST, you may still encounter errors, such as an inability to load the operating system. Reinstall the operating system and use the documentation that ships on the HP ProLiant Essentials Rapid Deployment Pack CD or refer to the software problems section in the *HP ProLiant Servers Troubleshooting Guide* for more information.

Refer to the *HP ProLiant Servers Troubleshooting Guide* for the following:

- Information you need to collect when diagnosing software problems and to provide when contacting support

- Instructions on how to upgrade the operating system and its drivers

- Information about available recovery options and advice on minimizing downtime.

B

Battery Replacement

System Board Battery Replacement

When the server blade no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about 5 to 10 years. Use an HP 540-mAh, lithium, 3-V replacement battery (spare P/N 234556-001).

To install a new battery:

1. Access the internal server blade components. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

2. Locate the battery holder on the system board.

3. Push the tab aside, and pull the existing battery straight up.
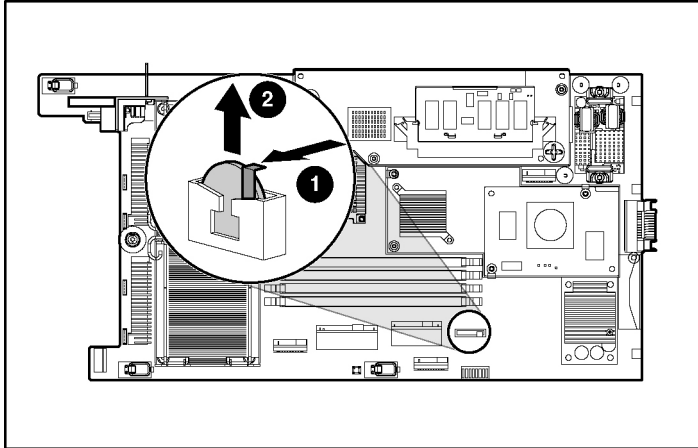
Figure B-1: Battery holder

⚠ **WARNING: For proper battery disposal, refer to the "Battery Replacement Notice" section in Appendix C, "Regulatory Compliance Notices."**

4. To install the new battery, push it into the socket until the tab locks in place.

⚠ **CAUTION:** The battery is keyed to install only with the positive side facing the tab. Do not force the battery into the socket facing the other direction.

5. Install the access panel. Refer to the "Accessing Internal Server Blade Components" section in Chapter 3, "Server Blade Setup."

6. Install the server blade in the server blade enclosure. Refer to the "Installing a Server Blade" section in Chapter 3, "Server Blade Setup."

7. Power up the server blade. Refer to the "Powering Up the Server Blade" section in Chapter 2, "Server Blade Operations."

8. Run RBSU to reconfigure the system with the new battery. Refer to the "ROM-Based Setup Utility" section in Chapter 5, "Server Blade Configuration and Utilities."

C

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certification and identification, your product has been assigned a unique series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this series number. The series number should not be confused with the marketing name or model number of then product.

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian Notice (Avis Canadien)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

$\mathsf{C}\,\mathsf{E}$

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and, if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) – Electromagnetic Interference

- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) – Electromagnetic Immunity

- EN 60950 (IEC 60950) – Product Safety

Japanese Notice

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Korean Notice

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니
판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약
잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기
바랍니다.

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能
會造成射頻干擾，在這種情況下，使用者會被要求採
取某些適當的對策。

Battery Replacement Notice

Your computer is provided with an internal lithium battery or battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Unless specific replacement instructions are provided as part of this guide, replacement is to be done by an authorized service provider using the spare designated for this product.

For more information about battery replacement or proper disposal, contact an authorized reseller or authorized service provider.

⚠ **WARNING: Your computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury,**

- **Do not attempt to recharge the battery.**

- **Do not expose to temperatures higher than 60°C (140°F).**

- **Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.**

- **Replace only with the spare parts designated for this product.**

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, authorized HP Partners, or their agents.

D

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.

- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

Several methods for grounding are available. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

- Use heel straps, toe straps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

- Use conductive field service tools.

- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

NOTE: For more information on static electricity or for assistance with product installation, contact an HP authorized reseller.

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